

# MONTHLY WEATHER REVIEW.

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BOARD OF EDITORS { Mr. Horace E. Smith, Chief Clerk of Weather Bureau,  
Professors Henry A. Hazen, Thomas Russell, and Charles F. Marvin, and  
Mr. Edward B. Garriott, in charge of Review Room.

## INTRODUCTION.

This REVIEW is based on reports for April, 1893, from 3,054 regular and voluntary observers. These reports are classified as follows: 166 reports from Weather Bureau stations; 42 reports from United States Army post surgeons; 2,115 monthly reports from state weather service and voluntary observers; 214 reports through the Southern Pacific Railway Company; 487 marine reports through the co-opera-

tion of the Hydrographic Office, Navy Department; 30 reports from Canadian stations; marine reports through the "New York Herald Weather Service"; monthly reports from local services established in all states and territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

Reports of voluntary observers in Oregon were not received in time to be used in the preparation of this REVIEW.

## CHARACTERISTICS OF THE WEATHER FOR APRIL, 1893.

### TEMPERATURE.

In the Southern States east of the Rocky Mountains the month was the warmest, and in the Northwestern States, over the middle and northern plateau regions, and on the north Pacific coast it was the coolest April on record. The principal cold wave of the month advanced from the Missouri Valley to the Gulf and south Atlantic states from the 12th to the 15th, carrying the frost line to Oklahoma and thence over Tennessee. On the 7th, 8th, and 13th frost damaged fruit at points in California. Frost was noted on the 22d in Tennessee and northeastern Alabama, and on the 23d and 24th in northern Georgia and the Carolinas.

### PRECIPITATION.

In the Ohio and upper Mississippi and lower Missouri valleys, in Washington, and at Block Island, R. I., the monthly precipitation was the greatest, and on the middle and southeast slopes of the Rocky Mountains, over the southern plateau region, and at Fort Buford, N. Dak., and Charlotte, N. C., it was the least ever reported for April. In New York, the Ohio, upper Mississippi, and Missouri valleys, and in western Colorado, Utah, and Washington cold and wet weather interfered with farming operations. In the south Atlantic and east Gulf states, central Texas, and east-central and southeastern Colorado the month was unusually dry. Heavy snowstorms visited New York and New England on the 7th, the Northwestern States on the 11th, 12th, 19th, and 20th, the Cascade Mountain region, Washington, on the 20th and 21st, and southwestern Utah on the 29th and 30th. The total depth of snowfall was 20 to 30 inches at points in northwestern Massachusetts, north-central New York, northern Wisconsin, western South Dakota, Wyoming, southwestern Utah, eastern Nevada, and west-central Montana.

### STORMS.

The month was marked by exceptionally destructive tornadoes and thunderstorms in the Western and Southwestern States. One hundred and fourteen lives are known to have been lost, and property to the estimated value of over \$1,000,000 was destroyed. The first group of storms visited Missouri, Iowa, and the lower Ohio Valley on the 11th and extended over southern Lower Michigan during the 12th. On those dates 38 persons were reported killed, and the property loss was placed at over \$500,000. The storms of the night of the 11th and the 12th in Missouri and the upper Mississippi valley were anticipated by warnings sent from this office the afternoon and evening of the 11th, announcing the probability of severe local storms in Missouri and eastern Iowa. The observer at Dubuque, Iowa, reports that much valuable river property, at that point, was saved by the timely warning.

The tornadoes that visited Oklahoma and northeastern Texas on the 25th caused the loss of 34 lives, of which number 30 are credited to Cleveland County, Okla. The morning of the 28th, the date of the Cisco, Tex., tornado, in which 22 lives were lost and property to the value of \$400,000 was destroyed, a warning of severe local storms for the north part of eastern Texas was issued by the Weather Bureau. The Great Lakes were swept by storms of great violence during the month, the period extending from the 19th to the 21st being especially notable for the prevalence of destructive gales. The Lake storms of those dates were announced by signal orders and special warnings sent by the Weather Bureau to all Lake ports the early morning of the 19th.

### OPENING OF NAVIGATION.

Navigation opened on the Mississippi and Missouri rivers and all of the Great Lakes, except Lake Superior.

Chicago, Ill., Milwaukee, Wis., and Grand Haven, Mich., reported a tidal wave on the 7th.

## ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for April, 1893, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

Chart VI exhibits the normal distribution of atmospheric pressure and prevailing wind-directions over the United States for April. The publication of the charts of this series is preliminary to the publication by the Weather Bureau of specially prepared data and charts showing meteorological and climatic features and conditions of the United States.

In April, 1893, the mean pressure was highest along the immediate middle Pacific and south Atlantic coasts and over the Florida Peninsula, where it was above 30.10, and the mean readings were above 30.00 over the British Northwest Territory north of North Dakota and eastern Montana. The mean pressure was lowest in an area extending from Lake Superior southwestward to the southeast slope of the Rocky Mountains, and over the greater part of the southern plateau region, where it was below 29.90.

In April there is usually a decrease of pressure over the United States and Canada, except along the north Pacific coast and over Maine and the Canadian Maritime Provinces, where the normal pressure is slightly higher than for March. The most marked decrease of pressure usually occurs in the middle Missouri valley and on the northeast slope of the Rocky Mountains, where it is more than .10. In British America west of Hudson Bay the decrease of pressure probably exceeds .20.

A comparison of the pressure chart for April, 1893, with that of the preceding month shows a decrease of pressure, except over New England and the Canadian Maritime Provinces, and on the middle and north Pacific coasts. The most marked decrease of pressure was shown in an area extending from the Dakotas and Minnesota southward to Texas, where the mean pressure was .15 to .20 lower than for March. The greatest increase of pressure was noted along the Pacific coast between the 40th and 45th parallels, where the mean values were .15 to .18 higher than for March. On the extreme southeast New England coast, and over New Brunswick and eastern Quebec the increase of pressure was .05.

The mean pressure was above the normal over the Atlantic coast, east Gulf, and middle and south Pacific coast states; it was also slightly above the normal in the British Northwest Territory. The greatest departure above the normal was shown in New England and at Hatteras, N. C., where the mean pressure was .10, or more, higher than usual. Over northern California and northwestern Nevada the mean readings were .05, or more, above the normal. The most marked departure below the normal was shown from Lake Superior to the Rio Grande River, where the mean values were .05 to .10 lower than usual.

## HIGH AND LOW AREAS.

The paths of areas of high and low barometric pressure over the United States and Canada during April, 1893, are shown on Charts IV and I, respectively, and some of the more prominent characteristics of the areas are given in the table at the end of this chapter.

## HIGH AREAS.

Twelve high areas appeared, the average number traced for April during the last 18 years being 8. The average velocity of the high areas, 34 miles per hour, was about 8 miles per hour greater than the average velocity of high areas for April. Of the high areas traced for the current month, 2 advanced from the Pacific coast between the 40th and 45th parallels, 7 appeared over the British Northwest Territory, 1 over the northern plateau region, 1 on the northeast slope of the Rocky

Mountains, and 1 over the region north of Lake Superior. One of the Pacific high areas reached the New England and the other the south Atlantic coast. Three of the high areas from the British Northwest Territory and the high area from the northern plateau region reached the New England coast, 2 disappeared over the Gulf of Saint Lawrence, 1 passed off the south Atlantic coast, and 1 occupied the middle Rocky Mountain region at the close of the month. The high area from the northeast slope of the Rocky Mountains advanced to the south Atlantic coast. The high areas of the month followed two principal paths, one from the British Northwest Territory eastward north of the Great Lakes and thence over New England or the Canadian Maritime Provinces, and the other southeastward to the upper Mississippi valley and thence to the Atlantic coast. The following is a description of the high areas traced on Chart IV.

I.—Occupied Manitoba at the opening of the month. The morning report of the 1st showed a fall in temperature of 20° to 30° in the Red River of the North Valley, and a reading of 6° below zero at Prince Albert, N. W. T. By the evening report of that date the center of the high area had moved to the region north of Lake Superior, and the temperature had fallen 20° to 30° in an area extending from eastern Iowa over Lake Superior. During the 2d this high area moved southeastward over New York and New England, the temperature fell 20° to 30° from the middle Ohio valley over New England and the Saint Lawrence Valley, the morning report showed temperature below freezing generally in the Lake region, and in the evening freezing weather was reported in northern New England. The morning of the 3d the pressure was above 30.40 over southeastern New England, and the temperature was 14° to 16° below freezing in eastern Maine and Nova Scotia.

II.—Appeared over the middle Missouri valley the morning of the 4th, and passed thence to the southwestern lake region by the evening report, with a fall in temperature of 20° from southern Wisconsin over west-central Lower Michigan. During the 5th this high area moved southeastward and disappeared off the south Atlantic coast, the morning temperature was below the freezing point in the lower lake region, and the evening report showed a slight fall in temperature in the middle Atlantic and New England states. The morning of the 6th the temperature was below 32° generally in New York and New England.

III.—Occupied the eastern Saskatchewan valley the morning of the 5th, with pressure above 30.50, and by the evening of that date had passed eastward over Manitoba, with a fall in temperature of 20° over the central part of the Dakotas. During the 6th this high area advanced to New England, with pressure rising above 30.60, and a slight fall in temperature from the Ohio Valley over the middle Atlantic and New England states. The morning of the 7th a fall in temperature of 20° was shown at Lynchburg, Va., and freezing weather was noted generally in New England.

IV.—Apparently advanced from the Pacific coast, and the evening of the 7th occupied southwestern Montana and the adjoining part of Idaho, with pressure above 30.20. On that date heavy frost injured foliage and pear buds about Keeler, Cal., and the temperature fell 30° to 40° from southeastern Montana over western South Dakota. During the 8th the high area moved over the middle Missouri valley, and a fall in temperature of 20° to 30° occurred from the southern lake region to northwestern Texas. During the 9th this high area moved eastward over the southern lake region, with a slight fall in temperature in the middle Atlantic and New England states, and during the 10th passed over New England and the Canadian Maritime Provinces.



V.—Advanced eastward from the Pacific coast between the 40th and 45th parallels the night of the 8th, and passing thence eastward, reached the southern New England coast on the 11th. Following closely number IV, this high area was attended by slight changes in temperature, except in western North Carolina, where a fall of  $20^{\circ}$  was noted the morning of the 11th.

VI.—Advanced southeastward from the British Northwest Territory and occupied North Dakota the evening of the 13th, with pressure above 30.40. On that date the temperature fell  $20^{\circ}$  to  $30^{\circ}$  in the upper lake region, was about  $20^{\circ}$  below the normal from the middle-eastern slope of the Rocky Mountains over the middle Missouri valley, and reached  $32^{\circ}$  at Davenport, Iowa, in the morning. During the 14th this high area passed to Colorado, and drifting thence eastward occupied an elongated area extending from Minnesota and Lake Superior to Texas at the evening report. On that date the temperature fell  $20^{\circ}$  to  $30^{\circ}$  in the Ohio and lower Mississippi valleys, and was about  $20^{\circ}$  below the normal in the middle Mississippi and middle and lower Ohio valleys. In the morning, heavy frost injured early fruit, especially plums, about Kearney, Nebr., and the temperature fell to the freezing point in central Indiana.

During the 15th this high area advanced slowly eastward over the Ohio Valley, the temperature fell  $20^{\circ}$  to  $30^{\circ}$  over parts of the Gulf and south Atlantic states and Virginia, freezing weather was noted in central Ohio in the morning, and frost injured fruit blooms and tender vegetation in Illinois, Kentucky, Missouri, Kansas, Arkansas, and Oklahoma. The evening of the 16th this high area covered the North-eastern States. On that date the temperature fell  $10^{\circ}$  to  $20^{\circ}$  in the south Atlantic states, and light frost was reported in the morning in eastern Kentucky, eastern Tennessee, in northern parts of the east Gulf states, and in Virginia and western North Carolina. During the 17th this high area passed eastward over the Canadian Maritime Provinces.

VII.—Advanced from the Oregon coast to Utah during the 15th, passed thence to Iowa during the 16th, and moved thence to the middle Mississippi valley by the morning of the 17th. On the 17th the pressure was high from the Great Lakes to the Gulf and middle and south Atlantic coasts, an area of high pressure advanced from Manitoba to Lake Superior, and anti-cyclonic centers were located over lower Lake Michigan, the upper Ohio valley, and eastern Tennessee. The morning of the 18th a ridge of high pressure extended from eastern Lake Superior to the south Atlantic states and Virginia, and during that date this high area passed off the south Atlantic coast. Following closely number VI this high area was attended by slight changes in temperature. The morning of the 18th light frost occurred in the southern Alleghany Mountain region, and heavy frost was reported at Lenoir, N. C.

VIII.—Appeared north of Lake Superior the morning of the 19th, with pressure above 30.20, and passed thence to the Gulf of Saint Lawrence by the evening of the 20th, with pressure rising above 30.40. The passage of this high area was unattended by noteworthy features.

IX.—Moved southeastward over the Missouri Valley during the 22d, following the passage of low area VI, and the evening of that date occupied an elongated area extending from the Red River of the North Valley to Oklahoma. Moving eastward over the Ohio Valley during the 23d this high area disappeared off the middle Atlantic coast during the 24th. The morning of the 22d considerable damage was caused by frost in eastern Tennessee, strawberries and tender vegetation about Nashville, Tenn., were damaged the morning of the 23d, and the morning of the 24th heavy frost occurred in Virginia and the District of Columbia.

X.—Appeared over Alberta the evening of the 23d. On that date the temperature fell  $20^{\circ}$  to  $35^{\circ}$  over the middle

plateau region and on the northeast slope of the Rocky Mountains, and was  $20^{\circ}$  to  $25^{\circ}$  below the normal over Montana in the evening. During the 24th this high area moved slowly eastward north of Montana. During the 25th the high area passed to the region north of Lake Superior, and by the evening of the 26th had reached the New England coast. After the 23d the passage of this high area was attended by slight changes in temperature.

XI.—Appeared on the northeast slope of the Rocky Mountains on the 25th, with a marked fall in temperature in the middle and northern Rocky Mountain regions, and temperature  $20^{\circ}$  below the normal in Colorado the evening of that date. During the 26th the high area advanced to the middle-eastern slope of the Rocky Mountains, passed thence over the Ohio Valley during the 27th, and disappeared off the south Atlantic coast during the 28th. The passage of this high area was unattended by marked temperature changes in the central valleys and the Atlantic coast states.

XII.—Occupied Alberta the evening of the 26th, and moved slowly eastward north of Montana during the 27th, with a slight fall in temperature over the Western States. During the 28th the high area advanced to Manitoba, with pressure rising above 30.30, and a fall in temperature of  $20^{\circ}$  to  $30^{\circ}$  on the middle-eastern slope of the Rocky Mountains. On the 29th this high area passed southwestward to the middle Rocky Mountain region, the morning temperature at Dodge City, Kans., was  $32^{\circ}$ , and the temperature was  $20^{\circ}$  to  $30^{\circ}$  below the normal in Colorado, Kansas, and Nebraska. From the evening of the 29th until the close of the month this high area remained about stationary over Colorado, a slight fall in temperature occurred in the Southwest, and the temperature was  $20^{\circ}$  below the normal in the middle Missouri valley.

#### LOW AREAS.

The average velocity of low areas for April is about 26 statute miles per hour. A principal track of April low areas is traced from Wyoming eastward to New England, and thence to the Banks of Newfoundland. Less frequented tracks are traced from the British Northwest Territory to the Lake region, and from the southern plateau region and the south Atlantic coast northeastward toward the Great Lakes and Newfoundland, respectively. An average of about one low area per month traverses the continent from the Pacific to the Atlantic coasts.

The tracks of eight low areas are shown on Chart I for April, 1893, the average number traced for the corresponding month of the last 20 years being 10. Of the low areas traced for the current month 3 advanced from the Pacific coast, 2 from the southern plateau region, 2 from the southeast slope of the Rocky Mountains, and 1 from Alberta. Two of the low areas from the Pacific coast reached the Gulf of Saint Lawrence, and 1 disappeared over the Missouri Valley. One of the low areas from the southern plateau region, and the low area from Alberta, advanced to the Gulf of Saint Lawrence; the other low area from the southern plateau disappeared over the Ohio Valley. One of the low areas from the southeast slope of the Rocky Mountains disappeared over the Gulf of Saint Lawrence, and the other passed south of Nova Scotia. The average velocity of the low areas, 33 miles per hour, was about 7 miles per hour greater than the average velocity of low areas for April. The following is a description of the low areas whose paths are plotted on Chart I:

I.—The month opened with an area of low pressure over Alberta, where it remained nearly stationary until the night of the 2d. On the 1st heavy rain fell on the north Pacific coast, and snow was reported in the region north of North Dakota. During the 2d the rain area extended southward over the Pacific coast to San Francisco; snow fell in the Lake Superior region and the Red River of the North Valley, and

the temperature rose  $20^{\circ}$  from the Dakotas over northern Illinois. During the 3d the center of disturbance moved eastward over the Dakotas and Minnesota to central Wisconsin, the temperature rose  $20^{\circ}$  to  $26^{\circ}$  over the lower lakes, rain fell from the middle Mississippi and Ohio valleys over the Lake region and western parts of the Atlantic coast states, and thunderstorms were noted from Lower Michigan to western Virginia. By the evening of the 4th the storm-center had reached the lower Saint Lawrence valley, and rain was quickly followed by clearing weather in the Atlantic coast states. On that date thunderstorms were reported in New England, high winds caused some damage in eastern New York, and westerly gales prevailed over the Lake region.

II.—Advanced from the Pacific coast and the evening of the 3d was central north of Washington, with pressure below 29.60, and heavy rain on the north Pacific coast. During the 4th this low area advanced to the middle Missouri valley, and a disturbance developed on the southeast slope of the Rocky Mountains. The morning of the 5th the storm-center occupied Oklahoma, from which position it apparently moved northward the night of the 5th and united by the morning of the 6th with low area III which had extended southeastward over the plateau and central Rocky Mountain regions. On the 5th rain fell in areas in the central valleys and the Lake region, and thunderstorms were noted in eastern Tennessee in the afternoon.

III.—Advanced over the Oregon coast during the 5th, with rain in the middle and north Pacific coast states and high winds in the central valleys of California. During the 6th the center passed to southeastern Montana, with pressure below 29.10, the temperature rose  $20^{\circ}$  in the Northwest and was  $20^{\circ}$  to  $30^{\circ}$  above the normal on the middle-eastern slope of the Rocky Mountains, rain fell generally on the middle and north Pacific coasts, in the plateau regions, the British Northwest Territory, and north-central districts, heavy gales prevailed in the middle and southern Rocky Mountain and plateau regions, and thunderstorms and high wind caused considerable damage in the western lake region.

During the 7th this low area advanced to Lake Superior, with central pressure 29.20, the temperature rose  $20^{\circ}$  to  $30^{\circ}$  in the Ohio Valley and the Lake region, and was  $20^{\circ}$  to  $35^{\circ}$  above the normal in the middle Mississippi valley, the rain area reached the middle Atlantic and New England coasts, snow fell in the Northwest, severe thunderstorms occurred in the Lake region and New York, and destructive gales prevailed in the Western and Northwestern States and the Lake region. Moving eastward this low area reached the lower Saint Lawrence valley the evening of the 8th. On that date the temperature rose  $20^{\circ}$  to  $30^{\circ}$  in the middle Atlantic states, and was  $20^{\circ}$  to  $30^{\circ}$  above the normal in parts of eastern Pennsylvania, Maryland, and Virginia, and unusually severe thunderstorms occurred in New England during the afternoon and evening. By the morning of the 9th the storm-center had disappeared over the Gulf of Saint Lawrence.

IV.—Apparently developed over the southern plateau region, and the morning of the 10th occupied Utah, with pressure below 29.80. By the evening report the center of disturbance had moved eastward to Colorado, with pressure below 29.50, snow over the middle plateau region, and high winds in the Rocky Mountain districts. During the 11th this low area passed northeastward to the middle Missouri valley, with pressure falling to 29.00 at Sioux City, Iowa, at the evening report. On that date rain fell generally in the Ohio, middle and upper Mississippi, and Missouri valleys, snow was reported in North Dakota and Montana, heavy gales prevailed in the central valleys and the western lake region, and destructive local storms occurred throughout the Western States. In the evening a well-defined tornado moved northeast over a part of Lafayette County, Mo.; tornadoes

were also reported in Iowa and Kansas. By the morning of the 12th the storm-center had passed northward to Minnesota, with pressure 28.86 at Moorhead, and by the evening report had advanced to northeastern Minnesota, with a marked increase in central pressure. On that date the rain area extended to the middle and south Atlantic coasts, snow fell in the Northwest, exceptionally severe gales prevailed over the Great Lakes and the middle and northern districts of the central valleys, and destructive local storms occurred in the Ohio and Mississippi valleys and the upper lake region. During the 13th this low area moved eastward to the middle Saint Lawrence valley, with an appreciable loss of energy, the rain area contracted to the Atlantic coast, snow fell in the northern lake region, and southwesterly gales prevailed over the Lake region.

V.—Developed during the 13th in the southwest part of a trough of low pressure which extended from the Lake region and Saint Lawrence Valley to the Rio Grande River, and at the evening report was central near Abilene, Tex., with pressure below 29.70. During the 14th this low area moved rapidly northeastward to the middle Atlantic coast, rain fell generally south of the Lake region, high winds occurred over the Gulf States, and destructive local storms were reported in the Southwestern States. The morning of the 15th the low area was central near Philadelphia, Pa., with pressure below 29.60, and by the evening report had passed northeastward off the New England coast, with rapidly clearing weather in the middle Atlantic and New England states, and northwest gales along the Atlantic coast north of North Carolina.

VI.—Apparently developed over the southern Rocky Mountain region on the 17th, and during the 18th moved to Oklahoma, with pressure falling below 29.50, rain generally in the central valleys, and thunder and hail storms in Kansas, Nebraska, and Missouri during the day and evening, and an unusually severe thunder and rain storm at Galveston, Tex., at night. During the 19th the center advanced to eastern Missouri, with pressure below 29.20, rain in the central valleys and the Gulf and middle and south Atlantic states, and destructive local storms in the Southern States and the Mississippi Valley, and hard gales over the upper lakes. The morning of the 20th the low area was central near Davenport, Iowa, with pressure 28.80, and by the evening report had reached western Lake Michigan, with pressure 28.90 at Milwaukee, Wis. On that date the rain area contracted northward and covered the middle and northern districts east of the Rocky Mountains, snow fell in the middle and upper Mississippi and Missouri valleys and the northern lake region, and destructive local storms occurred in the Atlantic coast states, the Lake region, and the Ohio and upper Mississippi valleys. On the 21st the center of disturbance moved slowly northward to eastern Lake Superior, with pressure rising above 29.30, the rain area contracted over the north-central and northeastern districts, snow fell in the upper Mississippi valley and the upper lake region, and gales prevailed over the Lake region, the middle and upper Mississippi and Ohio valleys, and the Atlantic coast states. Moving eastward with a marked decrease of energy, this low area disappeared over the Gulf of Saint Lawrence by the morning of the 23d.

VII.—Appeared on the north Pacific coast on the 21st, and during the 22d moved eastward toward Calgary, Alberta, with pressure below 29.60, and rain from the middle and north Pacific coasts over west parts of the middle and northern plateau regions. During the 23d the storm-center passed southeastward over Montana, with pressure below 29.50, the rain area extended over the middle plateau region, snow fell on the northeast slope of the Rocky Mountains, and an exceptionally severe thunder and rain storm was reported at



Salt Lake City, Utah, in the afternoon. By the evening of the 24th this low area had moved southward to Kansas, rain fell in the western lake region and the middle and upper Mississippi and Missouri valleys, and snow continued in the extreme northwest.

During the 25th the low area remained nearly stationary over Oklahoma, with pressure about 29.50 at the evening report, rain fell generally over the interior of the country, unusually well-defined tornadoes occurred in the evening in Oklahoma and northeastern Texas, and thunderstorms were noted thence over the lower Missouri, middle Mississippi, and lower Ohio valleys. By the evening of the 26th the center of disturbance had advanced to the extreme upper Mississippi valley, with pressure below 29.50, rain had fallen from the interior of the Gulf and south Atlantic states over the Lake region and the Northwest, thunderstorms were reported in Arkansas, Indiana, Alabama, and Lower Michigan, and heavy winds prevailed over the Great Lakes. During the 27th this low area passed slowly northeastward over Lake Superior, with pressure below 29.40 at the morning report, the rain area contracted to the Saint Lawrence Valley and the New England States, and high west winds continued over the Great

Lakes. By the evening of the 28th the low area had disappeared over the Gulf of Saint Lawrence.

VIII.—Appeared central over the middle plateau region the morning of the 27th, to which position it had apparently advanced from the southward, and by the evening of that date had passed eastward over Colorado, with pressure below 29.70, and rain along the middle and west Gulf coasts. During the 28th this storm moved southeastward to Oklahoma, with rain in the upper Mississippi valley, snow in the Northwest, very destructive tornadoes in north-central Texas and Oklahoma in the evening, and heavy rain and hail storms in Missouri. During the 29th this low area moved northeastward, and at the evening report a trough of low pressure extended from the middle Atlantic coast to Texas. On that date rain fell over the northern and central districts east of the Rocky Mountains, snow was reported in the middle Rocky Mountain region, and thunderstorms occurred from the middle Mississippi valley to the middle Atlantic coast. During the 30th the pressure continued low from the upper Ohio valley to Texas, rain fell generally in the central valleys, and destructive rain, wind, and thunder storms were reported in the Ohio and lower Mississippi valleys.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change in 12 hours, maximum abnormal temperature change in 12 hours, and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.				Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.		
High areas.							Days.	Miles.		Inch.										
I.....	1	51	97	43	73		1-5	35	White River, Ont.....	.92	1	Quebec, Que.....	27	2	Atlantic City, N. J.....	nw.	30	2		
II.....	4	43	99	35	74		1-5	42	.....do.....	.88	4	Swift Current, N. W. T....	25	3	Cleveland, Ohio.....	nw.	28	5		
III.....	5	52	104	42	72		1-5	47	Qu'Appelle, N. W. T.....	.60	5	Chicago, Ill.....	20	6	Block Island, R. I.....	ne.	48	6		
IV.....	7	45	114	47	71		2-5	38	Miles City, Mont.....	.78	7	Pierre, S. Dak.....	32	7	Swift Current, N. W. T....	s.	26	8		
V.....	8	42	124	41	68		3-0	43	Wilmington, N. C.....	.28	11	Charlotte, N. C.....	20	11	Winnemucca, Nev.....	sw.	30	8		
VI.....	13	47	100	47	65		3-5	35	Moorhead, Minn.....	.68	13	Abilene, Tex.....	29	14	Hatteras, N. C.....	ne.	36	17		
VII.....	15	45	124	33	82		3-0	37	Calgary, N. W. T.....	.30	15	Concordia, Kans.....	12	16	Chicago, Ill.....	sw.	36	16		
VIII.....	19	48	86	48	72		1-0	27	Chatham, N. B.....	.42	19	Montreal, Que.....	11	19	Alpena, Mich.....	sw.	30	19		
IX.....	21	50	107	38	80		3-0	24	La Crosse, Wis.....	.35	21	Cincinnati, Ohio.....	12	22	Bismarck, N. Dak.....	ne.	36	23		
X.....	23	52	115	41	71		3-0	32	Calgary, N. W. T.....	.42	23	Helena, Mont.....	32	23	Atlantic City, N. J.....	e.	32	26		
XI.....	25	48	111	37	80		2-5	34	Abilene, Tex.....	.45	25	Rapid City, S. Dak.....	28	24	Rapid City, S. Dak.....	nw.	34	26		
XII.....	26	51	114	40	106		4-0	19	Edmonton, N. W. T.....	.24	26	Concordia, Kans.....	24	28	Winnipeg, Man.....	w.	12	28		
Mean.....							2-5	34		.53			23					31		
Low areas.										Fall.			Rise.							
I.....	2	51	113	48	70		2-0	47	Chatham, N. B.....	.70	4	Rochester, N. Y.....	21	3	Winnemucca, Nev.....	sw.	56	2		
II.....	3	52	121	37	96		2-0	40	Swift Current, N. W. T....	.21	4	Valentine, Nebr.....	25	4	Fort Canby, Wash.....	s.	72	3		
III.....	5	44	124	48	71		3-0	37	Port Huron, Mich.....	.51	7	.....do.....	33	6	Rapid City, S. Dak.....	sw.	63	7		
IV.....	10	40	113	47	72		3-5	29	Pueblo, Colo.....	.62	10	Dodge City, Kans.....	21	11	Amarillo, Tex.....	w.	66	11		
V.....	13	33	100	43	67		2-0	42	Lynchburg, Va.....	.32	14	Chattanooga, Tenn.....	10	14	Galveston, Tex.....	nw.	54	14		
VI.....	17	37	102	46	80		5-0	16	Toledo, Ohio.....	.58	20	Pueblo, Colo.....	17	17	Detroit, Mich.....	ne.	72	20		
VII.....	22	50	115	49	70		5-5	26	White River, Ont.....	.64	25	Buffalo, N. Y.....	18	26	Huron, S. Dak.....	se.	56	23		
VIII.....	27	40	113	37	93		2-0	27	Dodge City, Kans.....	.40	27	Pueblo, Colo.....	23	27	Chicago, Ill.....	ne.	53	30		
Mean.....							3-1	33		.51			21					61		

#### NORTH ATLANTIC STORMS FOR APRIL, 1893.

[Pressure in inches and millimeters; wind-force by Beaufort scale.]

The paths of storms that appeared over the west part of the north Atlantic Ocean during April, 1893, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Over the north Atlantic Ocean the April normal pressure is highest in a belt extending from the west coast of Africa between the 20th and 30th parallels south of west to the 50th meridian, where it is above 30.10 (764), and is lowest in an area which occupies Iceland and southeast Greenland and the ocean thence to the 50th parallel, where the values fall below 29.80 (757).

The principal track of April storms is traced from Nova Scotia eastward to the 40th meridian, where it divides, one branch passing to Iceland and the other to the region west of Ireland. From the ocean west of the British Isles one class of storms passes southeastward over the Bay of Biscay and another to the north of Scotland. An average of 1.5 storm per month traverses the ocean from coast to coast in April. The average velocity of April storms over the north Atlantic is about 20 statute miles per hour.

The severest storms noted for April, 1893, occurred over the western part of the ocean on the 1st, 2d, 5th, and 18th, and over mid-ocean north of the Azores on the 18th. From the 8th to the 16th the pressure continued low in the region of the Azores, and high pressure obtained over and near the

British Isles. The pressure was also high over the British Isles from the 2d to 4th and 28th to 30th.

The month opened with a severe storm central south of Newfoundland, where the pressure fell to about 29.00 (736), and northwest gales of hurricane force were encountered. By the 2d this storm had moved east of the Grand Banks, and a second storm had advanced from the Saint Lawrence Valley to a position south of Newfoundland. By the 3d the storms had united and occupied mid-ocean north of the 50th parallel, where the pressure continued low during the 4th, after which the storm-center disappeared north of the region of observation. During the 5th low area I passed eastward over Newfoundland, with northwest gales of force 11 to 12 in the trans-Atlantic tracks between the 55th and 65th meridians during the early morning. By the 6th this storm had passed northeastward beyond the region of observation.

Reports of the 8th showed the development of a storm of marked energy east of the Banks of Newfoundland, where gales of hurricane force were encountered during that date. Reports of that date also indicated the presence of a disturbance southeast of the Azores. On the 9th 3 well-defined storms appeared, one, low area III, passed southeastward south of Newfoundland, one was central south of the Grand Banks, and the third occupied the ocean south-southeast of the Azores. By the 10th low area III had passed southeastward and united with the storm central south of the Grand Banks, and the storm southeast of the Azores had apparently moved eastward. From the 11th to the 13th low area III occupied the ocean west of the Azores. By the 14th this storm had moved northeastward to about the 40th parallel, and from the 15th to the 18th was central north of the Azores, where it was attended by hard gales. By the 19th this storm had advanced to the British Isles.

The night of the 15th low area V moved eastward south of Nova Scotia, and by the morning of the 16th had apparently moved rapidly eastward and united with the storm which occupied mid-ocean. The morning of the 17th a storm of considerable strength appeared off the south Atlantic coast, where northwest gales of force 9 to 11 were encountered in the early morning. Moving northeastward, this storm reached the 40th parallel the morning of the 18th, and during the 19th passed northeastward over Newfoundland, attended during its passage south of Newfoundland on the 18th by west to north gales of force 10. On the 21st a storm of slight energy appeared over mid-ocean, from which region it moved slowly southeastward with an apparent increase of strength, and disappeared in the direction of the Mediterranean Sea by the 25th. During the 23d low area VI disappeared north of Newfoundland. On the 27th a storm of slight energy ap-

peared south of Newfoundland, from which position it moved slowly eastward, and at the close of the month was central northeast of the Banks of Newfoundland.

#### OCEAN ICE IN APRIL.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for April during the last 11 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
April, 1883.....	40 49	52 06	April, 1883.....	48 00	43 00
April, 1884.....	41 36	48 46	April, 1884.....	45 25	43 34
April, 1885.....	41 40	49 50	April, 1885.....	44 10	39 41
April, 1886.....	40 51	46 39	April, 1886.....	47 43	30 11
April, 1887.....	40 02	50 04	April, 1887.....	48 00	38 18
April, 1888.....	41 33	50 00	April, 1888.....	47 40	49 00
April, 1889.....	43 57	50 30	April, 1889.....	47 16	43 11
April, 1890.....	40 00	49 40	April, 1890.....	47 26	35 42
April, 1891.....	40 01	48 24	April, 1891.....	45 33	43 32
April, 1892.....	42 46	49 37	April, 1892.....	48 58	44 27
April, 1893.....	42 28	50 14	April, 1893.....	46 50	46 05
Mean.....	41 25	49 37	Mean.....	47 00	41 31

\* Isolated iceberg.

The limits of the region within which icebergs or field ice were reported for April, 1893, are shown on Chart I by ruled shading. The southernmost ice reported, small patches of field ice, observed on the 21st in the position given, was about 1° north of the average southern limit, and the easternmost ice reported, small bergs on the 26th in the position given, was about 4½° west of the average western limit of ice for April. No ice was reported during the first half of the month, and that noted at intervals from the 17th to the 29th was encountered near the east edge of the Banks of Newfoundland.

#### OCEAN FOG FOR APRIL.

The limits of fog belts west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the 55th meridian fog was reported on 14 dates; between the 55th and 65th meridians on 19 dates; and west of the 65th meridian on 10 dates. East of the 55th and west of the 65th meridians the dates of occurrence of fog corresponded in number with the average for April for the last 5 years; between the 55th and 65th meridians the number of foggy days numbered 9 greater than the average. The occurrence of fog along the steamship tracks west of the 40th meridian and at stations of the Weather Bureau on the middle Atlantic and New England coasts generally attended the approach or passage of general storms.

#### TEMPERATURE OF THE AIR (expressed in degrees Fahrenheit).

The distribution of mean temperature over the United States and Canada for April, 1893, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the temperature is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in the Colorado Desert,

Cal., and over extreme southern Florida, where it was above 75, and the mean values were above 70 in Florida, southern Georgia, southern Mississippi, southern Louisiana, central and southern Texas, and in the Gila and lower Colorado valleys. South of a line traced from North Carolina to extreme northwestern Texas, thence to extreme southern New Mexico, thence to extreme southern Nevada, and thence to extreme south-central California the mean temperature was above 60. The lowest mean temperature was noted at mountain stations in Colorado, and north of a line traced from extreme northern upper Michigan over northern Minnesota and northeastern North Dakota, where it was below 40, and the mean readings were below 40 north of a line traced from the middle New England coast to western South Dakota, thence to north-central New Mexico, and thence irregularly northwestward to



northern Idaho. The mean temperature was also below 40 in the Sierra Nevada Mountains in eastern California.

#### DEPARTURE FROM NORMAL TEMPERATURE.

In the Atlantic coast states south of Maryland and thence westward over Texas and southern New Mexico the month was warmer than usual; elsewhere the mean temperature was below the normal. In central Texas the departure above the normal temperature was 4 to 6, and it was 4 to 5 over a great part of the south Atlantic states. The month was 2 to 4 warmer than usual generally over the Southern States east of southeastern New Mexico. The most marked departure below the normal temperature was noted over the northern part of the country from Minnesota to the valley of the Columbia River, where the mean readings were 6 to 8 lower than usual. The month was 4, or more, colder than usual from the extreme upper Mississippi valley to the central valleys of California and the north Pacific coast.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for April for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for April, 1893; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for April during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of April.	(2) Length of record.	(3) Mean for April, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for April.			
					Highest.	Year.	Lowest.	Year.
<i>Arizona.</i>	°	Years	°	°	°		°	
Fort Apache.....	52.5	21	51.4	- 1.1	59.5	1879	47.5	1884
Fort Mohave.....	70.8	22	69.7	- 1.1	77.1	1881	62.2	1891
Whipple Barracks.....	51.2	21	48.4	- 2.8	61.8	1876	45.4	1884
<i>Arkansas.</i>								
Keesees Ferry.....	61.8	11	61.0	- 0.8	65.3	1888	56.7	1884
<i>California.</i>								
Fort Bidwell.....	47.1	22	40.0	- 7.1	55.9	1881	40.0	1893
Riverside.....	60.4	11	60.7	+ 0.3	63.8	1885	57.8	1891
<i>Colorado.</i>								
Las Animas.....	51.2	11	52.2	+ 1.0	56.7	1888	46.2	1884
<i>Florida.</i>								
Merritts Island.....	71.8	11	74.5	+ 2.7	75.4	1883	67.0	1886
<i>Georgia.</i>								
Forsyth.....	65.1	19	69.4	+ 4.3	69.4	1893	61.0	1875
<i>Idaho.</i>								
Boise Barracks.....	50.1	19	46.4	- 3.7	56.5	1888	44.2	1883
Fort Sherman.....	46.2	9	42.2	- 4.0	50.9	1889	41.8	1882
<i>Indiana.</i>								
Lafayette.....	50.6	13	50.3	- 0.3	53.9	1886	45.4	1881
<i>Indian Territory.</i>								
Fort Supply.....	56.8	14	58.2	+ 1.4	61.6	1898	50.0	1874
<i>Iowa.</i>								
Cresco.....	43.3	21	39.6	- 3.7	47.3	1878	37.5	1874
<i>Kansas.</i>								
Eureka Ranch.....	54.7	10	53.6	- 1.1	58.6	1888	49.8	1892
Independence.....	57.6	21	58.1	+ 0.5	61.7	1878	48.3	1874
Salina.....	55.5	10	55.0	- 0.5	60.1	1889	49.6	1884
<i>Louisiana.</i>								
Grand Coteau.....	69.5	10	72.2	+ 2.7	73.2	1893	66.0	1891
<i>Maine.</i>								
Orono.....	40.0	23	.....	.....	45.1	1889	33.3	1874
<i>Maryland.</i>								
Cumberland.....	49.0	22	52.3	+ 3.3	57.6	1881	45.0	1874
<i>Michigan.</i>								
Kalamazoo.....	47.1	16	45.2	- 1.9	52.9	1878	42.0	1881
<i>Missouri.</i>								
Sedalia.....	56.7	10	54.4	- 2.3	61.5	1888	52.7	1885
<i>Montana.</i>								
Fort Custer.....	46.3	11	.....	.....	50.6	1889	42.1	1880
<i>Nebraska.</i>								
Fort Robinson.....	47.2	9	42.8	- 4.4	52.8	1888	41.6	1884
Genoa (near).....	49.0	17	46.7	- 2.3	53.0	1890	42.2	1881
<i>Nevada.</i>								
Browns.....	55.2	22	49.3	- 5.9	63.4	1888	46.8	1883
Carson City.....	48.6	16	44.0	- 4.6	56.1	1881	43.1	1880
<i>New Hampshire.</i>								
Hanover.....	41.3	22	38.2	- 3.1	46.9	1887	33.7	1874
<i>New Mexico.</i>								
Fort Wingate.....	49.0	22	47.6	- 1.4	57.3	1881	39.2	1874
<i>New York.</i>								
Cooperstown.....	40.9	22	39.8	- 1.1	51.6	1878	33.6	1874
Plattsburg Barracks.....	41.4	22	37.6	- 3.8	47.9	1878	33.6	1874
<i>North Carolina.</i>								
Lenoir.....	55.7	20	59.6	+ 3.9	60.0	1887	42.6	1885
<i>Oklahoma.</i>								
Fort Reno.....	60.5	9	61.8	+ 1.3	64.3	1889	55.8	1884
Fort Sill.....	61.6	21	65.0	+ 3.4	65.5	1880	53.7	1874
<i>Oregon.</i>								
Bandon.....	49.3	9	.....	.....	52.5	1889	45.3	1886

#### Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of April.	(2) Length of record.	(3) Mean for April, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for April.			
					Highest.	Year.	Lowest.	Year.
<i>Pennsylvania.</i>	°	Years	°	°	°		°	
Dyberry.....	42.2	21	41.8	- 0.4	49.7	1878	35.0	1874
Grampian.....	43.4	22	44.3	+ 0.9	52.2	1878	29.0	1875
Wellsboro.....	43.7	14	40.1	- 3.6	52.2	1886	40.1	1881, 1893
<i>South Carolina.</i>								
Statesburg.....	62.2	12	67.4	+ 5.2	67.4	1893	60.1	1884
<i>South Dakota.</i>								
Fort Sully.....	46.8	21	42.4	- 4.4	55.5	1887	39.2	1875
<i>Texas.</i>								
Austin.....	70.7	20	75.8	+ 5.1	75.8	1893	63.1	1874
Silver Falls.....	61.6	7	66.1	+ 4.5	66.1	1893	59.4	1886
<i>Utah.</i>								
Terrace.....	52.8	20	46.9	- 5.9	62.5	1888	45.4	1882
<i>Vermont.</i>								
Strafford.....	40.8	20	35.8	- 5.0	48.3	1886	34.9	1874
<i>Virginia.</i>								
Dale Enterprise.....	53.7	13	55.1	+ 1.4	59.1	1886	51.6	1882
<i>Washington.</i>								
Fort Townsend.....	48.6	19	43.5	- 5.1	52.4	1889	43.5	1893
<i>West Virginia.</i>								
Parkersburg.....	54.0	12	55.5	+ 1.5	64.1	1882	43.0	1885
<i>Wisconsin.</i>								
Embarrass.....	44.2	22	.....	.....	54.9	1879	34.7	1874
Madison.....	44.5	21	42.4	- 2.1	52.5	1876	37.4	1874
<i>Wyoming.</i>								
Fort Washakie.....	42.7	10	36.8	- 5.9	46.6	1889	36.8	1893

#### TEMPERATURE, JANUARY TO APRIL, 1893.

For the period January 1 to April 30, 1893, the mean temperature averaged 2 to 4 below the normal in the middle Atlantic and New England states, the Ohio Valley and Tennessee, the Lake region, the upper Mississippi and Missouri valleys, the northeast and middle-eastern slopes of the Rocky Mountains, over the middle and northern plateau regions, and along the north and middle Pacific coasts, and was about 1 below the normal in the south Atlantic states and at Key West, Fla. In the extreme northwest and on the southeast slope of the Rocky Mountains the temperature averaged 1 to 2 above the normal. In the Gulf States, over the southern plateau region, and along the south Pacific coast the mean temperature averaged about normal for the period named.

#### YEARS OF HIGHEST MEAN TEMPERATURE FOR APRIL.

In the south Atlantic and Gulf states and eastern Tennessee the current month was the warmest April on record. The highest mean temperature for April was noted in the Northwestern States and along the immediate Pacific coast in 1889; from the central valleys of California and the interior of Oregon over the middle plateau and middle Rocky Mountain regions in 1888; and from the middle and upper Mississippi valleys to the middle Atlantic coast and over the Lake region and western New England in 1878.

#### YEARS OF LOWEST MEAN TEMPERATURE FOR APRIL.

On the Pacific coast north of the 40th parallel, over the middle and northern plateau regions, in the Red River of the North and middle Missouri valleys, and on the southeast New England coast the current month was the coolest April on record.

In the Mississippi Valley and thence over the middle Atlantic and New England states the lowest mean temperature for April was noted in 1874.

#### MAXIMUM TEMPERATURE.

At stations in the south Atlantic states and Texas, and in the Mississippi, Ohio, and lower Missouri valleys, and the southwestern lake region the maximum temperature for the current month was the highest ever reported for April. The maximum temperature in the districts named was generally noted from the 6th to the 10th.

The highest temperature reported by a regular station of the Weather Bureau, 98, was noted at Wichita, Kans., on the

6th. 97 was registered at Concordia, Kans., Abilene and San Antonio, Tex., and 96 at Yuma, Ariz. At points in the south Atlantic states, the middle Mississippi and upper Ohio valleys, from eastern Kansas over Texas and in adjoining parts of western Arizona and southern California, the maximum readings were 90 or above. Voluntary observers in eastern Kansas, southeastern Texas, Oklahoma, southwestern Arizona, and southeastern California report maximum temperature above 100, the highest reading reported, 108, being noted at Twohig, Tex. The lowest maximum reading, 50, was noted at Saint Vincent, Minn., and the maximum temperature was below 60 on the Maine and southeast New England coasts, from Lake Superior over the Red River of the North Valley, and along the Washington coast.

#### MINIMUM TEMPERATURE.

At a number of stations in California the minimum temperature noted from the 6th to the 10th was the lowest ever reported for April.

The lowest temperature reported by a regular station of the Weather Bureau, 3 below zero, was registered at Saint Vincent, Minn., on the 14th. The minimum temperature fell below 10 over eastern Upper Michigan, in North Dakota and western Minnesota, and in an area covering the middle and northern Rocky Mountain regions. North of a line traced from the south New England coast, south of west to southwest New Mexico, thence northwestward to the Sierra Nevada Mountain range, and thence to northern Idaho, the minimum temperature was below 30. The highest minimum temperature, 65, was noted at Key West, Fla., and the minimum values were above 50 along the South Carolina, Georgia, Florida, and Gulf coasts.

#### LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced from northern New Jersey south of west over the Ohio and middle Mississippi valleys and thence to southern Arizona, and the western limit of freezing weather is shown by this line continued northwestward over eastern California and central Oregon, thence eastward over the valley of the Columbia River, and thence to the northwest coast of Washington.

#### RANGES OF TEMPERATURE.

The greatest daily range of temperature is shown in the table of miscellaneous meteorological data. The greatest monthly range of temperature, 60 to 70, was noted in areas on the northeast and middle-eastern slopes of the Rocky Mountains, and in the lower Missouri valley. From those districts the monthly range decreased eastward to less than 30 on the southeast New England coast and to 30 at Hatteras, N. C., southeastward to 20 at Key West, Fla., and to 30 along the immediate Gulf coast, and westward to 20 at Fort Canby, Wash., and to 30 along the immediate middle Pacific coast.

#### COLD WAVES.

During the 1st a cold wave advanced from Manitoba over

the upper Mississippi valley and Lake Superior, with a fall in temperature of 20 to 30, and temperature below zero north of North Dakota and eastern Montana. During the 2d this cold wave overspread the Ohio Valley and the Lake region and reached New York and New England, with temperature below freezing. The morning of the 3d the temperature had fallen 20, and was 14 to 16 below the freezing point in Nova Scotia. A moderate cold wave advanced from the Northwest over the Lake region and New England from the 3d to the 5th. On the 5th the temperature fell 20 to 30 in the Northwest, and the morning of that date was 16 below zero at Prince Albert, N. W. T. On the 6th the temperature fell slightly from the upper Mississippi valley over the middle Atlantic and New England states, and the morning of the 7th a fall in temperature of 20 was noted at Lynchburg, Va., and the temperature was below freezing generally in New England.

On the 7th the temperature fell 30 to 40 in the Northwest. On the 8th this cold wave overspread districts between the southern lake region and northwestern Texas, and on the 9th caused a slight fall in temperature in the middle Atlantic and New England states. A cold wave appeared in the Missouri Valley on the 12th, advanced over the upper lake region during the 13th, with freezing temperature at Davenport, Iowa, in the morning; extended over the Ohio and lower Mississippi valleys on the 14th, with freezing weather to central Indiana, reached the Gulf and western parts of the south Atlantic states and Virginia on the 15th, and by the morning of the 16th caused a fall in temperature of 20 on the south Atlantic coast. No cold waves traversed the country east of the Mississippi after the 16th.

#### FROST.

The morning of the 7th heavy frost injured foliage and pear buds about Keeler, Cal. Fruit blossoms were damaged about Eureka and Pasadena, Cal., the morning of the 8th. Damage by frost was reported at Fresno and Keeler, Cal., the morning of the 13th. Fruit was reported injured by frost at Kearney, Nebr., and Albert, N. Mex., the morning of the 14th. On the 15th heavy frost injured fruit and tender vegetation in Oklahoma, eastern Kansas, and western and northern Missouri. Frost damaged fruit blossoms at points in Kentucky, Tennessee, and Ohio the morning of the 16th. Tender vegetation about Lenoir, N. C., was killed by frost on the 18th. Fruit about Montrose, Colo., was slightly damaged the morning of the 19th. Frost nipped fruit blooms and injured garden vegetables in northern New Mexico, Oklahoma, and southwestern Kansas on the 20th. Heavy frost was reported at points in southern Kansas and Missouri on the 21st. Considerable damage by frost was reported in eastern Tennessee and northeastern Alabama the morning of the 22d. The morning of the 23d frost injured tender vegetation from eastern Kansas over Missouri, Tennessee, and western North Carolina. On the 24th the frost line extended southward over the Atlantic coast states to northern Georgia. The morning of the 30th heavy frost was reported at Levan, Utah.

#### PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for April, 1893, as determined from reports of more than 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district

may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In April the monthly precipitation is usually greatest along the Pacific coast north of the 40th parallel, and at points in the lower Mississippi valley, where it exceeds 8.00. It is 4.00 to 6.00 generally in the Gulf and south Atlantic states, Kentucky, Tennessee, and southern Missouri, on the southeast New England coast, and in central Utah. Over a large



part of the Rocky Mountain and plateau regions the monthly precipitation is less than 1.00.

In April, 1893, the monthly precipitation was greatest along the immediate Pacific coast north of the 40th parallel, and in areas in the Ohio Valley, Missouri, and northern Arkansas, where it exceeded 10.00. The monthly amount exceeded 6.00 in the Sierra Nevada Mountains, Cal., at elevated stations in central Colorado, and in an area extending over the Ohio Valley, and thence to Oklahoma and southeastern Kansas, and was in excess of 4.00 generally in the Mississippi, Ohio, and lower Missouri valleys, the southern lake region, Pennsylvania, New Jersey, on the south New England coast, and in northern Idaho. No precipitation was reported generally in New Mexico, Arizona, and extreme southeastern California. In areas covering the interior of the south Atlantic states and parts of the Florida Peninsula, from central and western Nebraska to the Rio Grande River, and generally over the Rocky Mountain and plateau regions, except in areas in the middle and northern Rocky Mountain regions, the monthly precipitation was less than 1.00.

#### DEPARTURE FROM NORMAL PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for April for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for April, 1893; (4) the departure of the current month from the average; (5) and the extremes for April during the period of observation and the years of occurrence:

State and station.	(1) Average for the month of April.	(2) Length of record.	(3) Total for April, 1893.	(4) Departure from average.	(5) Extremes for April.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
<i>Arizona.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Fort Apache.....	0.87	17	0.00	- 0.87	1.77	1878	0.00	1893
Fort Mohave.....	0.39	22	0.00	- 0.39	4.05	1871	0.00	1880, 1893
Whipple Barracks.....	1.63	21	0.00	- 1.63	2.86	1878	0.00	1893
<i>Arkansas.</i>								
Keesees Ferry.....	4.13	11	8.33	+ 4.20	8.33	1893	1.57	1889
<i>California.</i>								
Fort Bidwell.....	1.68	21	1.88	+ 0.20	5.60	1880	0.16	1888
Riverside.....	1.00	12	0.26	- 0.74	2.15	1885	0.06	1890
<i>Colorado.</i>								
Las Animas.....	1.37	11	0.01	- 1.36	2.64	1886	0.01	1893
<i>Florida.</i>								
Merritts Island.....	4.04	15	0.32	- 3.72	9.74	1878	0.32	1893
<i>Georgia.</i>								
Forsyth.....	3.86	19	4.30	+ 0.44	9.59	1883	0.55	1888, 1892
<i>Idaho.</i>								
Boise Barracks.....	1.62	19	1.86	+ 0.24	2.43	1886	0.00	1890
Fort Sherman.....	1.58	9	4.75	+ 3.17	4.75	1893	0.00	1885
<i>Indiana.</i>								
Lafayette.....	3.42	13	6.65	+ 3.23	7.51	1892	0.84	1889
<i>Indian Territory.</i>								
Fort Supply.....	2.57	14	0.25	- 2.32	8.60	1885	0.25	1893
<i>Iowa.</i>								
Cresco.....	2.32	21	5.95	+ 3.63	5.95	1893	1.11	1883
<i>Kansas.</i>								
Independence.....	3.78	21	6.35	+ 2.57	6.68	1889	1.64	1883
Salina.....	2.56	10	.....	.....	7.30	1885	0.16	1888
<i>Louisiana.</i>								
Grand Coteau.....	4.47	10	2.12	- 2.35	10.64	1890	0.87	1891
<i>Maine.</i>								
Orono.....	2.85	23	.....	.....	5.08	1887	1.12	1892
<i>Maryland.</i>								
Cumberland.....	2.34	21	3.96	+ 1.62	6.50	1874	0.60	1879
<i>Michigan.</i>								
Kalamazoo.....	2.57	17	5.32	+ 2.75	8.00	1880	0.92	1876
<i>Missouri.</i>								
Sedalia.....	3.24	14	10.06	+ 6.82	10.06	1893	1.33	1888
<i>Montana.</i>								
Fort Custer.....	1.11	12	.....	.....	2.16	1887	0.51	1885
<i>Nebraska.</i>								
Fort Robinson.....	1.90	9	1.30	- 0.60	3.93	1892	0.47	1886
Genoa (near).....	2.83	17	2.22	- 0.61	5.32	1885	1.20	1878
<i>Nevada.</i>								
Brown.....	0.44	22	1.00	+ 0.56	1.47	1878	0.00	*
Carson City.....	0.93	16	1.01	+ 0.08	5.02	1880	0.03	1889
<i>New Hampshire.</i>								
Hanover.....	2.34	22	1.64	- 0.70	3.40	1874	0.38	1872
<i>New Mexico.</i>								
Fort Wingate.....	0.92	22	0.00	- 0.92	2.70	1877	0.00	1893
<i>New York.</i>								
Cooperstown.....	2.88	22	2.96	+ 0.08	4.10	1874	0.98	1881
Plattsburg Barracks.....	1.62	22	2.11	+ 0.49	3.98	1871	0.30	1881

#### Departures from average precipitation—Continued.

State and station.	(1) Average for the month of April.	(2) Length of record.	(3) Total for April, 1893.	(4) Departure from average.	(5) Extremes for April.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
<i>North Carolina.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Lenoir.....	3.57	21	2.50	- 1.07	7.80	1874	1.30	1876, 1885
<i>Oklahoma.</i>								
Fort Reno.....	2.33	10	1.92	- 0.41	6.02	1890	0.89	1887
Fort Sill.....	2.87	21	0.37	- 2.50	8.77	1890	0.37	1893
<i>Oregon.</i>								
Bandon.....	4.93	15	.....	.....	11.35	1891	0.97	1885
<i>Pennsylvania.</i>								
Dyberry.....	2.44	21	3.65	+ 1.21	5.07	1874	0.80	1882
Grampian.....	3.39	22	4.89	+ 1.50	6.11	1874	1.35	1870
Wellaboro.....	4.40	14	5.38	+ 0.98	10.77	1880	0.61	1892
<i>South Carolina.</i>								
Statesburg.....	2.22	12	0.65	- 1.57	4.17	1883	0.65	1893
<i>South Dakota.</i>								
Fort Sully.....	2.09	22	3.50	+ 1.41	4.82	1892	0.14	1884
<i>Texas.</i>								
Austin.....	3.62	20	0.20	- 3.42	7.78	1884	T.	1887
Silver Falls.....	2.63	7	0.03	- 2.60	4.58	1891	0.00	1892
<i>Utah.</i>								
Terrace.....	0.40	20	0.24	- 0.16	1.74	1884	0.00	*
<i>Vermont.</i>								
Strafford.....	2.65	20	2.12	- 0.53	12.20	1874	0.60	1873, 1881
<i>Virginia.</i>								
Dale Enterprise.....	3.60	13	2.86	- 0.74	7.13	1882	0.75	1881
<i>Washington.</i>								
Fort Townsend.....	1.64	17	3.74	+ 2.10	3.74	1893	0.38	1877
<i>West Virginia.</i>								
Parkersburg.....	3.26	8	5.13	+ 1.87	5.13	1893	2.20	1891
<i>Wisconsin.</i>								
Embarrass.....	2.78	22	.....	.....	5.20	1880	1.20	1889
Madison.....	4.37	20	4.53	+ 0.16	5.48	1880	0.96	1887
<i>Wyoming.</i>								
Fort Washakie.....	1.72	10	2.06	+ 0.34	3.73	1883	0.51	1888

\* Frequently.

The monthly precipitation was in excess of the usual amount for April in the Lake region and thence over the Ohio, middle and upper Mississippi and middle and lower Missouri valleys, the northern Rocky Mountain and plateau regions and thence to the Pacific coast north of the 40th parallel, and on the Texas, New Jersey, and south New England coasts; elsewhere less than the usual amount of precipitation was reported. The greatest excess in precipitation was noted on the north Pacific coast, and from east-central Missouri over central Illinois, where the amount was 6.00 to 7.00 inches greater than usual. On the south New England and New York coasts, in an area extending from southern Ohio over southern Missouri, at Galveston, Tex., over Washington, and along the immediate Oregon coast the excess was more than 2.00. The most marked deficiency, 4.1, was reported at Abilene, Tex., and in the south Atlantic states, northern Louisiana, and west-central Mississippi the monthly amount was 2.00 to 3.00 inches less than the April average.

Considered by districts the average percentage of the normal in districts where the monthly precipitation was in excess was about as follows: North Pacific coast, 254; upper Mississippi valley, 224; Lake region, 159; Ohio Valley and Tennessee, 155; Missouri Valley, 145; New England, 112. In districts where the precipitation was deficient the percentage of the normal was about as follows: Southeast slope of the Rocky Mountains, 6; south Pacific coast, 17; middle-eastern slope of the Rocky Mountains, 20; Key West, Fla., 41; south Atlantic states, 44; east Gulf states, 64; northeast slope of the Rocky Mountains, 80. In the middle Atlantic and west Gulf states, the extreme northwest, over the middle and northern plateau regions, and along the middle Pacific coast, the precipitation averaged about normal.

#### PRECIPITATION, JANUARY TO APRIL.

For the period January 1 to April 30, 1893, inclusive, the precipitation averaged about the normal amount in the middle Atlantic and New England states, the Ohio Valley and Tennessee, the lower lake region, on the northeast slope of the Rocky Mountains, and over the southern plateau region.

In the upper lake region, the extreme northwest, the upper Mississippi and Missouri valleys, over the middle and northern plateau region, and along the north and south Pacific coasts it was one-tenth to two-tenths greater than usual. On the middle and southeast slopes of the Rocky Mountains about one-third, and in the south Atlantic and Gulf states, and along the middle Pacific coast six-tenths to eight-tenths of the usual amount of precipitation fell.

#### YEARS OF GREATEST PRECIPITATION FOR APRIL.

At stations on the southeast New England coast, in the Ohio and middle and upper Mississippi valleys, and on the north Pacific coast the precipitation for the current month was the greatest ever reported for April.

In Maryland, the District of Columbia, and eastern Virginia the greatest precipitation for April occurred in 1889; over the west part of the middle plateau region in 1887; over the east parts of the middle and northern plateau regions in 1886; on the Maine coast in 1884; in the interior of the south Atlantic states in 1883; along the middle and south Atlantic coasts, and in the lower lake region and upper Ohio valley in 1880; and in areas from New England to the lower Mississippi valley in 1874.

#### YEARS OF LEAST PRECIPITATION FOR APRIL.

At Charlotte, N. C., Statesburg, S. C., Merritts Island, Fla., Abilene, Tex., Santa Fe and Fort Wingate, N. Mex., Fort Supply, Ind. T., Dodge City, Kans., Fort Sill, Okla., North Platte, Nebr., Fort Buford, N. Dak., and Keeler, Cal., the precipitation for the current month was the least ever reported for April.

On the middle and south Pacific coasts the least precipitation for April was reported in 1888; in the west Gulf states in 1887; and on the north Pacific coast in 1885.

#### EXCESSIVE PRECIPITATION.

The following tables show, by states, the number of stations reporting monthly precipitation to equal or exceed 10.00; precipitation to equal or exceed 2.50 in 24 hours; and precipitation to equal or exceed 1.00 in 1 hour in April, 1893:

##### Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
Missouri .....	28	Indiana .....	5
Illinois .....	10	California .....	4
Washington .....	9	Kentucky .....	3
Arkansas .....	6	Oregon .....	1

##### Precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Missouri .....	26	13, 13-14, 18-19, 19, 19-20, 24-25, 25-26, 29, 29-30, 30.	Indiana .....	4	10-11, 11, 19, 20, 28-29.
Arkansas .....	18	11, 12-13, 12-14, 13, 14, 26, 29-30, 30.	Washington .....	4	19, 19-20.
Alabama .....	14	12, 12-13, 19, 19-20.	North Carolina .....	3	19, 19-20.
Georgia .....	11	19-20.	Kentucky .....	3	14, 30.
California .....	9	3, 4, 4-5, 5, 5-6, 7.	Indian Territory .....	2	28-29.
Louisiana .....	9	14, 18-19, 19, 30.	Kansas .....	3	19, 25.
Tennessee .....	8	12-13, 12-14, 13, 13-14.	South Dakota .....	1	25-26.
Florida .....	8	19-20.	Ohio .....	1	28-29.
Mississippi .....	6	11-12, 13, 13-14, 30.	Oklahoma .....	1	29-30.
Illinois .....	4	3-4, 11, 11-12, 20, 30.	Oregon .....	1	19-20.
			Texas .....	1	18-19.
			Virginia .....	1	19-20.
			Minnesota .....	1	30.
			Nebraska .....	1	25-26.

##### Precipitation to equal or exceed 1.00 in 1 hour.

Texas .....	8	10, 14, 18, 19, 26, 28, 30.	Missouri .....	3	11, 13.
Louisiana .....	4	14, 19.	Arkansas .....	2	11, 30.
Florida .....	3	16, 20, 28.	Illinois .....	1	28.
			Nebraska .....	1	24.

Table of excessive precipitation, April, 1893.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<b>Alabama.</b>						
Auburn.....	Inches.	Inches.		Inches	h. m.	
Claiborne Landing.....		4.60	19-20			
Decatur a.....		2.94	19-20			
Florence b.....		3.98	12-13			
Highland Home.....		5.45	12			
Lynn a.....		2.74	19-20			
Maysville.....		2.75	12-13			
Mobile.....		3.50	12-13			
Montgomery.....		2.77	19-20			
Opelika.....		2.58	19-20			
Scuddevant.....		4.40	19-20			
Tallassee Falls.....		2.80	19			
Tuscumbia a.....		3.12	19-20			
Tuscumbia b.....		3.82	12-13			
Tuscumbia b.....		3.83	12-13			
<b>Arkansas.</b>						
Ashdown.....		3.60	30			
Brinkley.....		3.10	12-13			
Camden b.....		2.84	30			
Conway.....		4.17	30			
Corning.....	10.21	4.17	30			
Dallas.....				1.50	1 00	30
Fayetteville.....	11.73	5.00	29-30			
Fort Smith.....		4.98	29-30			
Helena a.....		7.05	12-14			
Helena b.....		5.89	13-14			
Hot Springs.....		2.50	13-14			
Do.....		2.75	30			
Keesee Ferry.....				1.10	0 30	11
Kirby.....		3.48	30			
Madding.....	11.14	2.88	30			
Mount Nebo.....		3.00	30			
Newport a.....		3.15	13-14			
Rogers.....	13.23	2.75	11			
Do.....		2.73	26			
Do.....		3.47	29-30			
Russellville.....		3.45	30			
Searcy.....	10.04	4.09	30			
Winslow.....	10.54	4.66	29-30			
<b>California.</b>						
Cloverdale.....		3.61	7			
Crescent City.....	12.12	3.10	4			
Crescent City L. H.....	13.78					
Edmonton.....		2.80	5			
Georgetown.....		2.98	5-6			
Grass Valley b.....		2.55	7			
Middletown.....		3.06	4-5			
Placerville b.....		2.88	6			
Shasta.....	10.19	3.65	5			
Upper Mattole.....	10.96	3.62	3			
<b>Florida.</b>						
Bristol.....		6.03	19-20			
Chattahoochee Landing.....		5.50	19-20			
Federal Point.....		3.74	19-20			
Jacksonville.....		2.54	19-20	1.70	1 00	30
Jupiter.....				1.10	0 40	16
Lake City.....		3.15	19-20	1.10		
Moseley Hall.....		5.38	19-20			
Plant City.....				1.03	0 30	28
Saint Francis Barracks.....		3.50	19-20			
Tallahassee.....		5.70	19-20			
<b>Georgia.</b>						
Alapaha.....		4.12	19-20			
Albany.....		4.00	19-20			
Darien.....		2.60	19-20			
Forsyth.....		3.23	19-20			
Fort Gaines.....		2.61	19-20			
Homerville.....		4.32	19-20			
Morgan.....		2.50	19-20			
Piscola.....		6.10	19-20			
Poulan.....		4.33	19-20			
Quitman.....		5.10	19-20			
Thomasville.....		5.50	19-20			
<b>Illinois.</b>						
Atwood.....	11.82	2.66	20			
Carlisle.....	10.94					
Flora.....	14.01	3.00	11			
Do.....		2.73	30			
Greenville.....	11.86					
Mascoutah.....	10.20					
Olney a.....	10.44					
Olney b.....	13.64					
Pana.....	16.56	5.13	3-4			
Rantoul.....				1.13	1 00	28
Shawneetown.....	10.55					
Springfield.....	10.23	2.50	11-12			
<b>Indiana.</b>						
Farmland.....	10.79					
Jasper.....	10.72	2.60	11			
Marengo.....	16.60	5.00	11			
Do.....		4.00	19			
Muncie.....	15.00	2.50	11			
Do.....		2.50	20			
Do.....		2.75	28-29			
Vevay.....		2.75	10-11			
Vincennes.....	10.60					
<b>Indian Territory.</b>						
Eufaula.....		4.03	28-29			
Tulsa.....		2.50	28-29			
<b>Kansas.</b>						
Columbus.....		3.24	25			



Table of excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Kansas—Continued.						
Yates Center.....	Inches.	Inches.		Inches.	h. m.	
Kentucky.						
Caddo.....	14.30	2.54	19			
Carrollton.....	11.10					
Earlington.....	10.91					
Franklin.....	10.09	2.50	14			
Russellville.....		2.63	14			
Wickliffe.....		3.18	30			
Louisiana.						
Calhoun.....		4.46	14			
Farmerville.....		4.20	14			
Do.....		3.25	30			
Franklin.....				2.00	2 00	14
Homer.....		5.12	14			
Do.....		2.60	30			
Houma.....		4.72	18-19			
Many.....		4.35	30	1.50	1 00	14
Monroe.....		3.03	14			
New Orleans.....		2.88	19	1.40	1 00	19
Paincourtville.....				1.45	1 15	14
Plain Dealing.....		3.00	14			
Sugar Experiment Station.....		2.61	19			
Minnesota.						
Collegeville.....		3.08	20			
Mississippi.						
Batesville.....		3.27	11-12			
Clarksville.....		2.81	13-14			
Corinth.....		5.53	13-14			
University.....		3.92	13			
Water Valley.....		2.53	13			
Woodville.....		2.60	30			
Missouri.						
Appleton City.....		2.95	19			
Arlington.....		2.50	30			
Big Piney.....		2.97	28			
Boonville.....	10.22	3.11	19-20			
Bryant.....	12.55	2.57	29-30			
Cabool.....	10.13					
Columbia.....	11.30					
Dixon.....	12.19	5.50	29			
Edge Hill.....		2.57	30			
Eight Mile.....		6.68	18-19			
Eldon.....	12.82					
Fayette.....	10.70					
Fox Creek.....	10.35					
Fulton.....		2.95	19-20			
Glensted.....		5.20	18-19			
Do.....	17.49	2.75	25-26			
Do.....		2.70	29			
Grovedale.....	11.10	2.50	30			
Hastain.....	10.48					
Humansville.....		2.50	19			
Kansas City.....				1.08	1 05	11
Lamar.....	10.56	3.00	18-19			
Lebanon.....	13.17	3.00	10			
Do.....		3.00	28			
Liberty.....				0.94	0 15	11
Malden.....		2.75	13			
Neosho.....		3.50	24-25			
New Haven.....	10.38					
Oakfield.....	11.08					
Osceola.....	11.48	2.62	19			
Oto.....		2.50	29			
Panacea.....	10.89	3.32	29-30			
Poplar Bluff.....	10.97	4.00	13-14	2.25	1 00	13
Rolla.....	11.71	5.10	29-30			
Saint Charles.....	11.01					
Saint Louis (W. B.).....	10.84	2.86	29-30			
Saint Louis (Vol. Obsr.).....	11.34					
Sedalia.....	10.06	3.28	19			
Steelville.....	12.05	4.51	29-30			
Vermont.....	10.77					
Warrensburg.....		2.51	18-19			
Warrenton.....	10.74					
Wheatland.....	12.61	2.96	19			
Whiteside.....	10.42					
Nebraska.						
Omaha.....				1.40	0 47	24
Stanton.....		2.50	25-26			
North Carolina.						
Columbus.....		3.32	19-20			
Highlands.....		4.65	19-20			
Horse Cove.....		2.92	19			
Ohio.						
Northwood.....		2.90	28-29			
Oklahoma Territory.						
Keokuk Falls.....		2.70	29-30			
Oregon.						
Astoria.....	13.39	3.40	19-20			
South Dakota.						
Flandreau.....		3.92	25-26			
Tennessee.						
Ashwood.....		2.55	13			
Charleston.....		2.61	12-13			
Chattanooga.....		2.77	12-13			
Clarksville.....		3.04	13-14			
Columbia.....		2.50	12-13			
Hohenwald.....		3.14	12-13			
Lynnville.....		2.78	12-13			
Waynesboro.....		3.90	12-14			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Texas.</i>						
Albany.....						
Galveston.....				1.62	1 00	10
Haskell.....		4.31	18-19	1.07	1 00	18
New Braunfels.....				2.00	2 00	28
San Antonio.....				1.64	1 30	14
Stella.....				1.10	0 50	14
Do.....				1.30	1 05	26
Sugar Land.....				1.42	0 45	30
Do.....				1.27	1 00	26
Tyler.....				2.10	2 00	30
				1.82	1 30	19
<i>Virginia.</i>						
Avon.....		2.60	19-20			
<i>Washington.</i>						
Aberdeen.....	12.29	2.63	19			
East Clallam.....	11.16					
Elbe.....	10.45					
Ferry.....	12.31					
Fort Canby.....	10.89	3.74	19-20			
Neah Bay.....	14.62	3.33	19-20			
Olympia.....	10.18					
Silver Creek.....	10.54					
Tatoosh Island.....	13.03	3.72	19-20			

Received too late for publication in March Review.

<b>California.</b>						
Julian.....	14.42	3.89	20-21			
Upper Mattole.....	18.05	4.25	11-12			
Do.....		3.11	18-19			
<b>Oregon.</b>						
Cascade Locks.....	10.03					

## MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during April, 1893, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering gauges:

Maximum rainfall in one hour or less.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Atlanta, Ga.*.....	Inch.		Inch.		Inch.	
Bismarck, N. Dak.*.....	0.10	20	0.15	20	0.30	19
Boston, Mass.*.....	0.06	8	0.08	8	0.20	21
Buffalo, N. Y.*.....	0.10	7	0.20	7	0.45	7
Cincinnati, Ohio.....	0.18	30	0.24	30	0.33	11
Chicago, Ill.....	0.24	26	0.34	26	0.60	26
Cleveland, Ohio*.....	0.04	30	0.07	30	0.22	30
Denver, Colo.†.....	0.10	26	0.15	26	0.30	26
Detroit, Mich.....	0.10	26	0.15	26	0.30	26
Dodge City, Kans.†.....	0.10	11	0.18	11	0.75	11
Duluth, Minn.*.....	0.02	4	0.03	4	0.11	4
Eastport, Me.*.....	0.25	18	0.33	18	1.07	13
Galveston, Tex.....	0.20	12	0.25	12	0.67	30
Indianapolis, Ind.....	0.33	20	0.45	20	1.70	30
Jacksonville, Fla.....	0.35	21	0.60	16	1.10	16
Jupiter, Fla.....	0.20	11	0.35	11	1.05	11
Kansas City, Mo.....	0.03	21	0.08	21	0.23	21
Key West, Fla.....	0.30	30	0.40	30	0.60	30
Marquette, Mich.*.....	0.07	10	0.13	10	0.24	10
Memphis, Tenn.....	0.17	29	0.26	29	0.67	29
Milwaukee, Wis.†.....	0.16	11	0.20	11	0.52	11
New Orleans, La.....	0.02	6	0.03	6	0.13	6
New York, N. Y.....	0.07	6	0.08	6	0.25	6
Norfolk, Va.....	0.12	20	0.15	20	0.30	20
Omaha, Nebr.....	0.15	26, 29	0.30	29	0.61	29
Philadelphia, Pa.....	0.09	20	0.10	20	0.15	20
Pittsburg, Pa.....	0.11	20	0.12	20	0.14	20
Portland, Oregon.....						
Saint Louis, Mo.....						
Saint Paul, Minn.....						
Salt Lake City, Utah.....						
San Diego, Cal.....						
San Francisco, Cal.....						
Savannah, Ga.....						
Tampa, Fla.....						
Washington, D. C.....						
Wilmington, N. C.....						

\* Record incomplete.

† Self-register out of order.

‡ Less than 0.05 in 1 hour.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily

precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several states and territories for April during the last 23 years:

*Excessive monthly precipitation.*

State.	No. years noted.	State.	No. years noted.
Louisiana	11	Indian Territory	1
Mississippi	11	Massachusetts	1
Arkansas	10	Michigan	1
North Carolina	8	Nebraska	1
Alabama	8	New York	1
Tennessee	7	Pennsylvania	1
Texas	6	Vermont	1
Georgia	5	Wisconsin	1
Illinois	5	California	1
Indiana	4	Arizona	1
Kansas	4	Delaware	0
Virginia	3	District of Columbia	0
Kentucky	3	Idaho	0
Oregon	3	Maine	0
Washington	3	Minnesota	0
Florida	2	Montana	0
Maryland	2	New Mexico	0
New Hampshire	2	Rhode Island	0
New Jersey	2	The Dakotas	0
Ohio	2	Utah	0
South Carolina	2	West Virginia	0
Missouri	2	Wyoming	0
Colorado	1		
Connecticut	1		

*Excessive daily precipitation (24 hours).*

Louisiana	16	Pennsylvania	3
Texas	16	Minnesota	3
Alabama	15	Oregon	3
Arkansas	15	Colorado	2
Georgia	15	Massachusetts	2
Tennessee	15	Vermont	2
Mississippi	14	Wisconsin	2
North Carolina	14	Ohio	2
Florida	11	Maine	1
Kansas	11	Michigan	1
The Dakotas	10	Montana	1
Illinois	10	New Jersey	1
Indian Territory	9	New Mexico	1
Indiana	9	Rhode Island	1
Kentucky	7	Wyoming	1
Missouri	7	Washington	1
Iowa	6	Arizona	0
Nebraska	6	Delaware	0
California	5	District of Columbia	0
Virginia	5	Idaho	0
Maryland	4	Nevada	0
South Carolina	4	New Hampshire	0
Connecticut	3	Utah	0
New York	3	West Virginia	0

*Excessive hourly precipitation.*

Texas	12	California	0
Arkansas	6	Colorado	0
Florida	5	Connecticut	0
Illinois	5	Delaware	0
Kansas	4	District of Columbia	0
Tennessee	4	Idaho	0
Iowa	4	Indiana	0
North Carolina	4	Kentucky	0
Louisiana	4	Maine	0
Alabama	3	Massachusetts	0
Georgia	3	Minnesota	0
Mississippi	3	Montana	0
Missouri	3	Nevada	0
South Carolina	2	New Hampshire	0
The Dakotas	2	New York	0
Nebraska	2	Oregon	0
Indian Territory	1	Rhode Island	0
Maryland	1	Utah	0
Michigan	1	Vermont	0
New Jersey	1	Virginia	0
New Mexico	1	Washington	0
Ohio	1	West Virginia	0
Pennsylvania	1	Wisconsin	0
Arizona	0	Wyoming	0

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for April during the last 23 years:

*Monthly.*

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
Summit, Cal	Inches.	1880	Mount Washington, N. H.	Inches.	1878
Jackson, Miss	30.40	1874	Newport, Ark.	23.41	1886
Paulding, Miss	23.80	1871	Brookhaven, Miss	21.20	1876
	23.60			20.35	

*Daily (24 hours).*

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Terrell, Tex	18.00	22-24, 1879	New Haven, Conn.	5.90	3-4, 1876
Mount St. Helena, Cal.	14.70	20-21, 1880	Helena, Ark.	5.89	13-14, 1893
Point Pleasant, La.	12.28	5, 1885	Baltimore, Md.	5.82	25-26, 1889
Fort Smith, Ark.	11.00	23, 1879	Kosciusko, Miss	5.80	6, 1892
Vaiden, Miss.	9.92	4-6, 1892	Columbia, La.	5.75	3, 1890
Healdsburg, Cal.	9.73	20-21, 1880	Tallahassee, Fla.	5.70	19-20, 1893
Bay Saint Louis, Miss.	9.60	21-22, 1892	Saint Marys, Ga.	5.70	2-3, 1876
New Orleans, La.	9.22	7-8, 1883	Jasper, Ga.	5.69	5-6, 1892
Fayette, Miss.	9.00	15-16, 1880	Adamsville, Ga.	5.63	5, 1892
Florence, Ala.	8.71	5-7, 1892	Colorado, Tex.	5.60	23, 1890
Sugar Ex. Station, La.	8.12	21-22, 1892	Diamond, Tex.	5.58	6, 1892
Gallinas, Tex.	8.12	20-21, 1891	Scottsboro, Ala.	5.55	5, 1892
Melissa, Tex.	8.00	22-23, 1879	Kendall Green, D. C.	5.54	25-26, 1889
Palo Alto, Miss.	7.81	6-7, 1892	Rome, Ga.	5.54	3-6, 1892
Austin, Mo.	7.50	8-9, 1891	Corinth, Miss.	5.53	13-14, 1893
New Orleans, La.	7.49	21-22, 1892	New Orleans, La.	5.51	7, 1876
Ship Island, Miss.	7.48	21-22, 1892	Abingdon, Ill.	5.50	13, 1876
Brookhaven, Miss.	7.45	17-19, 1874	Clarksville, Tex.	5.50	22-23, 1879
Gadsden, Ala.	7.43	5-7, 1892	Chattahoochee Ldg, Fla	5.50	19-20, 1893
Point Pleasant, La.	7.35	6-7, 1883	Thomasville, Ga.	5.50	19-20, 1893
Santa Maria, Tex.	7.34	19-20, 1888	Dixon, Mo.	5.50	29, 1893
Mobile, Ala.	7.30	19, 1888	Washington B'ks, D. C.	5.45	24-25, 1889
Helena, Ark.	7.05	12-14, 1893	Florence, Ala.	5.45	12, 1893
Modesto, Cal.	7.00	20-21, 1880	Maurepas, La.	5.42	22, 1892
Pana, Ill.	7.00	3-4, 1892	Gainesville, Tex.	5.40	24, 1890
Shell Beach, La.	7.00	3-4, 1892	Columbus, Miss.	5.40	6-7, 1892
Valley Head, Ala.	6.89	5-6, 1892	Moseley Hall, Fla.	5.38	19-20, 1893
Helena, Ark.	6.83	22-23, 1879	Mobile, Ala.	5.34	24, 1881
Tusculum, Ala.	6.84	4-5, 1892	Fort Myer, Va.	5.30	25-27, 1889
West End, La.	6.80	21-22, 1892	Sacramento, Cal.	5.28	20, 1880
Marengo, Ind.	6.77	21, 1887	Glensted, Mo.	5.20	18-19, 1893
Wallace, La.	6.75	21, 1892	Nevada City, Cal.	5.20	21, 1880
Hat Creek, Wyo.	6.74	21-23, 1879	Gallinas, Tex.	5.20	17, 1891
Santa Rosa, Cal.	6.70	20-21, 1880	Norfolk, Va.	5.19	16-17, 1883
Eight Mile, Mo.	6.68	18-19, 1893	Saint Marks, Fla.	5.15	14-15, 1879
Emilie, La.	6.62	21-22, 1892	Pana, Ill.	5.13	3-4, 1893
Amite, La.	6.57	22-23, 1890	Breckenridge, Minn.	5.12	10-11, 1878
Ponst City, Cal.	6.54	20-21, 1880	Homer, La.	5.12	14, 1893
Fort Sill, Okla. T.	6.46	21-22, 1879	New Urm, Tex.	5.12	23-24, 1879
Corsicana, Tex.	6.31	22, 1879	Rolla, Mo.	5.10	29-30, 1893
Covington, Ga.	6.30	23, 1883	Quitman, Ga.	5.10	19-20, 1893
Fayetteville, N. C.	6.25	27-28, 1879	Charleston, S. C.	5.09	16-17, 1879
Marksville, La.	6.25	22, 1890	Nashville, Tenn.	5.04	21-22, 1883
Dardanelle, Ark.	6.20	15-16, 1890	Elk Falls, Kans.	5.04	20, 1885
Charleston, Ill.	6.12	3-4, 1892	Tomales, Cal.	5.02	20-21, 1880
Savannah, Ga.	6.11	16-17, 1879	Grainfield, Kans.	5.00	27, 1888
Piscata, Ga.	6.10	19-20, 1893	Dallas, Tex.	5.00	27, 1888
Bristol, Fla.	6.03	19-20, 1893	Melissa, Tex.	5.00	17, 1877
Point Pleasant, La.	6.02	2, 1885	Weatherford, Tex.	5.00	27-28, 1888
Hammond, La.	5.98	21-22, 1892	Newport, Ark.	5.00	17, 1886
Montgomery, Ala.	5.97	2, 1876	Lonoke, Ark.	5.00	3, 1890
Healdton, Ind. T.	5.97	28, 1892	Fort McHenry, Md.	5.00	23-25, 1889
Baton Rouge, La.	5.97	21-22, 1892	Fayetteville, Ark.	5.00	29-30, 1893
Julian, Cal.	5.92	1-2, 1892	Marengo, Ind.	5.00	11, 1893

*One hour and less.*

Station and state.	Amount.	Time.	Date.
	Inches.	h. m.	
Philadelphia, Pa.	0.45	0 05	16, 1891
Memphis, Tenn.	0.35	0 05	15, 1891
Jupiter, Fla.	0.35	0 05	21, 1893
Jacksonville, Fla.	0.33	0 05	20, 1893
Memphis, Tenn.	0.30	0 05	30, 1893
Do	0.30	0 05	30, 1892
Atlanta, Ga.	0.30	0 05	7, 1892
New Orleans, La.	0.27	0 05	19, 1893
Indianapolis, Ind.	0.27	0 05	28, 1892
Buffalo, N. Y.	0.25	0 05	9, 1890
Kansas City, Mo.	0.25	0 05	17, 1892
Galveston, Tex.	0.25	0 05	18, 1893
New Orleans, La.	0.25	0 05	17, 1890
Dodge City, Kans.	0.25	0 05	15, 1891
Omaha, Nebr.	0.25	0 05	24, 1893
Water Works, Philadelphia, Pa.	0.25	0 05	16, 1891
Adrian, Mich.	1.50	0 10	5, 1888
Philadelphia, Pa.	0.67	0 10	16, 1891
Jupiter, Fla.	0.60	0 10	16, 1893
Memphis, Tenn.	0.55	0 10	15, 1891
New Orleans, La.	0.53	0 10	17, 1890
Water Works, Philadelphia, Pa.	0.50	0 10	16, 1891
Egg Harbor City, N. J.	1.39	0 15	27, 1890
Jacksonville, Fla.	1.50	0 20	23, 1883
Denmark, Iowa.	1.00	0 20	24, 1880
Titusville, Fla.	1.78	0 25	19, 1888
Cabaniss, Ga.	2.00	0 30	1, 1874
Denmark, Iowa.	1.87	0 30	8, 1882
Little Rock, Ark.	1.50	0 30	6, 1882
Hack Rock, Ark.	3.42	0 40	20, 1892
Pilot Point, Tex.	3.00	0 45	28, 1879
Lozier, Tex.	3.50	1 00	11, 1891

\*Estimated.

*SNOW.*

On the 7th a heavy snowstorm prevailed over central New



York and extended thence over parts of New England during the evening. The Northwestern States were visited by a severe storm of wind and snow on the 11th and 12th. At Bismarck, N. Dak., heavy snow began 7 p. m., 11th, and continued through the 12th. During the 12th and 13th the snowstorm extended to Illinois and Indiana, and the morning of the 14th reached New York. An exceptionally heavy snowstorm visited Minnesota and northern Iowa on the 19th and 20th; 9 to 15 inches of snow fell in parts of Minnesota. Heavy snow fell in the Cascade Mountains, Washington, on the 20th and 21st. On the 27th and 28th heavy snow was reported in northern Iowa. On the 29th and 30th 6 to 12 inches of snow fell in Millard, Beaver, and Iron counties, Utah, causing the loss of many sheep.

#### MONTHLY SNOWFALL (in inches and tenths).

Chart V shows the depth of snowfall reported for the month.

The greatest depth of snowfall reported was 124, at Pikes Peak, Colo. A depth of 92 was noted at Summit, Cal.; 76 at Climax, Colo.; 49 at Saint Cloud, Minn.; and 34 at Beaver, Utah. In central Minnesota, the middle Rocky and middle and northern Sierra Nevada Mountains, and at points in the middle plateau region, western South Dakota, north-central Nebraska, northeastern Iowa, extreme northern Wisconsin, and northwestern Massachusetts, the monthly snowfall exceeded 20. More than 10 fell over large areas in the interior of New England and New York, from northern and western Wisconsin and Upper Michigan to the eastern Dakotas, from western South Dakota and northwestern Nebraska over the middle and northern Rocky Mountains, in eastern Nevada and southwestern Utah, and in an area covering northeastern California and southwestern Oregon.

The southern limit of snow is shown by a line traced southward over the Alleghany Mountains to extreme western North Carolina, thence to central and western Kentucky and northern Arkansas, thence to extreme north-central Kansas, thence to central New Mexico, and thence to the Sierra Nevada Mountains.

#### DEPTH OF SNOW ON GROUND ON THE 15TH AND AT THE CLOSE OF THE MONTH.

At points in the interior of northern New England and northern New York 5 to 10 was reported on the ground on the 15th. A slight depth was noted in the northern Ohio valley, the lower lake region, and Lower Michigan. In western Upper Michigan the depth varied from 6 to 12. Northern Minnesota and North Dakota reported trace to 6. Snowfall varying from 30 to 50 was reported at points in the middle and northern Rocky Mountains.

At the close of the month trace to 4 was reported at points in northern New England, and snow was reported at scattered points from Lake Superior to the middle and northern Rocky Mountains. In the mountains of Colorado a depth of 30 to 50 was noted at the close of the month.

Monthly snowfall of 5 inches, or more, was reported as follows, and in states and territories where the maximum depth was below that amount, the station reporting the greatest is given:

*Arkansas*.—Kirby, trace. *California*.—Summit, 92; Emigrant Gap, 56; Cisco, 47; Towles, 38; Truckee, 33; Boca, 16; Fort Bidwell, 15.5; Edgwood, 8.5; Nevada City, 7; Lick Observatory, 6.5; Shasta, 5.5. *Colorado*.—Pikes Peak, 124.1; Climax, 76; Breckenridge, 63.6; Steamboat Spring, 32; Red Cliff, 31.7; Ward District, 29.6; Gold Hill, 21.8; Saint Cloud, 21; Stamford, 19.5; Scissors, 18.5; Box Elder and Smoky Hill Mine, 18; Moraine and Pagoda (near), 15; Alma, 14; Greenhorn, 12; Sunnyside, 10.7; Rico, 10.3; Hugo (near), 10; Denver, 9.9; Como (near), 9.7; Castle Rock and Laverder, 9; Cumbres, 8; Collbran, 7.4; Grover, 7; Colorado Springs and Glen Eyrie, 6; McCoy, 5.

*Connecticut*.—South Manchester, 10; Canton, 9.5; New Hartford (a), 9.5; Hartford (b), 8.5; Falls Village and West Simsbury, 8; Southington, 7.5; North Grosvenor Dale and Storrs, 7; Colchester, Voluntown, and Waterbury, 6; Middletown, 5.5; North Franklin and Stevenson, 5. *Idaho*.—Bonanza City, 11; Lake, 6. *Illinois*.—East Peoria, 6. *Indiana*.—Farmland, 7; Columbia City, 6. *Iowa*.—Osage, 22; Storm Lake, 11.1; Algona, 11; Eagle Grove, 10.1; Denison and Vinton, 10; Larrabee, 9; Hampton, 8.5; Charles City and Cresco, 8; Hawkeye, 7.5; Grand Meadow, 7.1; Alta (a), Emmetsburg, and Grundy Center, 7; Ames (near), Centerville, Newton, and Richland, 6; Audubon, 5.6; Belle Plaine and Iowa Falls, 5. *Kansas*.—Monument and Oberlin, 1. *Kentucky*.—Hendricks, 0.1. *Maine*.—Houlton, 13.8; Farmington and Mayfield, 12; Kents Hill, 11.5; Easton, 11; Calais, 10.2; Eastport, 9.3; East Machias, 8.5; Bar Harbor, Belfast, Cornish, Gardiner, and Mattawamkeag, 8; Lewisburg, 7.2; Fairfield, 5.

*Maryland*.—Sunnyside, 3.5. *Massachusetts*.—Monroe, 21; Groton (a), 10.5; Mansfield and Williamstown, 10; Taunton (a), 9.1; Dudley, Somerset, Springfield Armory, and Westboro, 9; Leeds, 8.5; Lynn (a), Middleboro, Monson, Plymouth, Turners Falls, Webster, and Worcester (b), 8; Boston, 7.9; Blue Hill (summit), Ludlow Center, and Royalston, 7.5; Amherst Experiment Station, Leominster, and Winthrop, 7; Taunton (b), 6.8; Concord (a), Fitchburg (b), Provincetown, and Salem (b), 6.5; Beverly Farms, Fitchburg (a), Kendall Green, Randolph, and South Dennis, 6; Bedford, Chestnut Hill, and North Billerica, 5.5; Fall River (a), Lawrence, Milton, Mystic Lake, Mystic Station, Newburyport (b), Wakefield, and Wayland, 5.

*Michigan*.—Marquette, 18.8; Lathrop, 16.8; Calumet, 13; Escanaba, 8.5; Grayling, 7.5; Berrien Springs (a), 6; Sault Ste. Marie, 5.1; Berlin, 5. *Minnesota*.—Saint Cloud, 49; Long Prairie, 44; Park Rapids, 34.3; Morris, 32; Camden and Fort Ripley, 31; Alexandria (b) and Cambridge, 28; Maple Plain, 25.1; Alexandria (a) and Bird Island, 25; Collegeville, 24; Leech Lake, 23.5; Pine River, 22.5; Lake Winnibigoshish, 21.7; Sandy Lake Dam, 21; Saint Oloff, 20.5; Rolling Green and Willmar, 20; Saint Charles and Saint Vincent, 19; Pokegama Falls, 18.8; Montevideo, 18.5; Duluth and Wabasha, 18; Kinbrae, 16.8; Caledonia, 16.5; Fergus Falls, 15.6; Saint Paul, 15; Moorhead, Ortonville, and Rochester, 14; Alma, 13.2; Minneapolis and Winona, 13; Farmington, 12.5; Blooming Prairie, 12; Red Wing, 11.9; Sheldon, 10.8; Albert Lea, Grand Meadow, Minnesota City, and Redwood Falls, 10.

*Missouri*.—Centerville, 6. *Montana*.—Corbin, 22.4; Virginia City, 22; Deer Lodge City, 10.2; Fort Missoula, 10; Havre, 9.8; Dry Forks, 8.5; Columbia Falls, 6.5. *Nebraska*.—Whitman, 22; Kennedy, 20; Hartington, 14.5; Harrison, 14; Valentine, 13.5; Fort Robinson, 12.6; Hayes Center, 11.5; Springview, 9.5; Gering, 7.5; Kimball, 6.5; West Point, 6; Fort Sidney, 5.2. *Nevada*.—Austin, 26.5; Stofiel, 21; Ely, 15; Virginia City, 14.8; Tuscarora, 13; Lewers Ranch, 12.6; Empire Ranch and South Camp, 12; Halleck and Verdi, 10; Palisade, 9.5; Humboldt, 9; Toano and Wells, 8.5; Genoa, 8; Carson City, 7.2; Beowawe and Cranes Ranch, 7; Belmont, 6.5; Winnemucca, 6.4; Tybo, 6; Hot Springs, 5.7; Fenelon, 5.5.

*New Hampshire*.—Berlin Mills, 16.5; North Conway and Bethlehem, 12; Lancaster, 11.6; Littleton and Plymouth, 9.5; Stratford, 9; Hanover (a) and Nashua, 7; Brookline and East Canterbury, 6; Manchester, 5.5; Concord (a), Dublin, and Grafton, 5. *New Jersey*.—Deckerton, 3.8. *New Mexico*.—Folsom, 5. *New York*.—Lebanon Springs, 21; Turin, 18.2; Number Four, 16.7; Malone and Palermo, 15.2; Lowville, 15; Ampersand, 14.5; Le Roy, 14; Constableville, 13; Arcade, Plattsburg Barracks, and Victor, 12.5; Carthage, 11.5; Eden Center, 11; South Kortright, 10.8; Oxford, 10.5; Romulus,

10.4; Fleming, Humphrey, and Potsdam, 10; Rochester and South Canisteo, 9.6; Lyons, 9.5; Canton, 9.3; Utica, 9; Gloversville, 8.6; Geneva, 8.2; Brookfield, Cooperstown, Lockport, New Lisbon, North Hammond, Rondout, and Varysburg, 8; Madison Barracks, 7.8; Wappinger Falls, 7.5; Buffalo, 7.3; Wedgwood, 6.5; Honeymead Brook, 6.2; Middletown and West Point, 6; Watkins, 5.

*North Carolina.*—Blowing Rock and Highlands, trace.

*North Dakota.*—Milton, 17; Grand Forks, 16.2; Reynolds, 14.5; Jamestown, 14.4; Berlin and Ellendale, 13; Napoleon, 12.7; Grafton and Saint Johns, 12; Kelso, 9.5; Gallatin, 8.2; Minto, 7.5; Forman, 7; Woodbridge, 6.1; Lakota, Oakdale, and Wahpeton, 6. *Ohio.*—Mansfield, 7.2; Wheeler, 7; Hillhouse, 6.5; Garrettsville and Strongsville, 6; Bellevue, Benton Ridge, Levering, Napoleon, North Royalton, Ridgeville Corners, Shenandoah, and Vermillion, 5. *Oregon.*—Siskiyou, 47; Baker City, 8.2. *Pennsylvania.*—Erie, 7.5; Salem Corners, 7.3; Le Roy, 7; Blue Knob, 6. *Rhode Island.*—Kingston (b), Pawtucket, and Providence (a), 8; Lonsdale, 6.5; Bristol, 5.

*South Dakota.*—Spearfish, 29; Rosebud, 24; Gary, 22.5; Flandreau, 21.2; Oelrichs, 21; Aberdeen, 15.5; Webster, 14.6; Bear Valley, 11.5; Sioux Falls, 11; Cross, 10.5; Britton and Parker, 10; Kimball, 9; Bowdle and Salem, 8.5; Fort Meade, 8.4; Wentworth, 7.5; Hotch City, Plankinton, and Wolsey, 7; De Smet, Frankfort, Gale, and Wessington Springs, 5. *Texas.*—Ochiltree, 2. *Utah.*—Beaver, 34; Parowan, 13.5; Salt Lake City, 8; Grouse Creek, 7.8; Randolph, 7.5; Logan, 7.3; Mount Carmel, 7; Heber, 5.2. *Vermont.*—Jacksonville, 15.9; Chelsea and Strafford, 14; Hyde Park, 10.5; Irasburg and South Royalton, 10; Enosburg Falls, 9.5; Northfield, 9.3; Burlington, 9; Hartland, 8.5; Woodstock, 6.5; Cornwall, Norwich, and Wells, 6. *Virginia.*—Wytheville, 0.2. *Washington.*—Ellensburg, 9; Elbe, 6.5; Waterville, 6; Rosalia, 5.5; Chelan, 5.

*West Virginia.*—Davis, 3. *Wisconsin.*—Bayfield, 26; Florence, 22.5; Grantsburg, 20; Barron, 19; Hayward, 16; Menomonie, 15.3; Ashland, 15; Viroqua and Weston, 14.5; Sparta (b), 13.2; Chippewa Falls and Medford (a), 13; Hammond and Pepin, 12; Butternut and Koepenick, 11; La Crosse, 10.8; Amherst, 10; Hillsboro and Shell Lake, 9.5; Osceola, 9.3; Oconto, 9; Medford (b), 8.5; Mineral Point and Valley Junction, 8; Hudson, 7; Shawano, 6.5; Belleville and Westfield, 6; Black River Falls, 5.5; Lancaster and Reedsburg, 5. *Wyoming.*—Lander, 21.4; Fort Washakie, 20.6; Saratoga, 20; Sundance, 14.5; Camp Pilot Butte, 13.5; Cheyenne, 13.4; Fort Yellowstone, 9.8; Big Horn Ranch and Fort Washakie, 6.8; Sheridan, 5.5.

#### HAIL.

Description of the more severe hailstorms reported for the month are given under "Local storms."

Hail was reported as follows: 1st, Connecticut. 3d, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, New York, Ohio, Tennessee, Washington, and Wisconsin. 4th, Alabama, Georgia, Kentucky, New York, Tennessee, Virginia, and Wisconsin. 5th, Alabama, California, Indiana, Kentucky, Massachusetts, Missouri, and Tennessee. 6th, California, Illinois, Iowa, Michigan, Minnesota, Missouri, North Carolina, Ohio, Oklahoma, Oregon, South Carolina, and Wisconsin. 7th, California, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Vermont, Washington, and Wisconsin. 8th, Connecticut, Illinois, Indiana, Maine, Massachusetts, Missouri, New Hampshire, New York, Ohio, Pennsylvania, and Vermont.

9th, California, Indian Territory, Kansas, Missouri, Ohio, Oklahoma, and Washington. 10th, Arkansas, Kentucky, Missouri, New Jersey, Oklahoma, Oregon, Pennsylvania,

Texas, Utah, and Washington. 11th, Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Minnesota, Missouri, Nebraska, Oklahoma, South Dakota, Texas, and Wisconsin. 12th, Arkansas, California, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Mississippi, Missouri, Tennessee, Texas, Washington, and Wisconsin. 13th, Alabama, Arkansas, Indiana, Indian Territory, Maine, Mississippi, Missouri, Nebraska, Oregon, Tennessee, Texas, and West Virginia.

14th, Arkansas, Louisiana, Mississippi, Missouri, New Hampshire, New York, Ohio, Texas, and Washington. 15th, Indiana, Massachusetts, Mississippi, Missouri, New York, North Dakota, Pennsylvania, and South Dakota. 16th, Florida, Illinois, Michigan, North Carolina, Ohio, Washington, and Wisconsin. 17th, Maryland, Oklahoma, Pennsylvania, and Washington. 18th, Arkansas, Illinois, Kansas, Minnesota, Missouri, Nebraska, and Texas. 19th, Alabama, Arkansas, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Texas, Washington, and West Virginia. 20th, Connecticut, Florida, Georgia, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New York, Oklahoma, Pennsylvania, Texas, Virginia, and West Virginia.

21st, Florida, Illinois, Kansas, Maine, Missouri, New Hampshire, New York, Tennessee, Virginia, and West Virginia. 22d, Alabama, California, Illinois, Maryland, Massachusetts, Nevada, New Hampshire, New York, and Vermont. 23d, Connecticut, Florida, Kansas, Massachusetts, Missouri, New Hampshire, New Jersey, New York, Oklahoma, Texas, and Utah. 24th, Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, Ohio, Tennessee, and Wisconsin. 25th, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, Nebraska, Ohio, Oklahoma, Oregon, South Dakota, Tennessee, Texas, and West Virginia. 26th, Arkansas, Georgia, Idaho, Illinois, Indiana, Iowa, Louisiana, Michigan, Mississippi, Missouri, Nebraska, New Jersey, New York, North Dakota, Tennessee, Texas, Washington, and Wisconsin.

27th, Alabama, California, Georgia, Idaho, Louisiana, Maine, Massachusetts, Michigan, Missouri, North Carolina, Oregon, and Vermont. 28th, Alabama, Arkansas, California, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Mississippi, Missouri, Ohio, Oklahoma, and Texas. 29th, Alabama, Arkansas, Florida, Illinois, Indiana, Kansas, Kentucky, Maryland, Missouri, North Carolina, Ohio, Oklahoma, South Carolina, Texas, Utah, Virginia, and West Virginia. 30th, Arkansas, Illinois, Kansas, Louisiana, Mississippi, Missouri, North Carolina, Ohio, Pennsylvania, Texas, and West Virginia.

#### SLEET.

Description of the more severe sleetstorms reported for the month is given under "Local storms."

Sleet was reported as follows: 1st, Maine and Vermont. 3d, Iowa. 4th, Maine. 5th, Minnesota, Nevada, and Wisconsin. 6th, Idaho, Minnesota, Nevada, North Carolina, North Dakota, and Wisconsin. 7th, Maine, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, Vermont, and Washington. 8th, Maine, Nevada, and New Hampshire. 9th, Nevada. 10th, California, Nevada, and New York. 11th, Colorado, Nevada, North Dakota, South Dakota, and Wisconsin. 12th, California, Minnesota, Nevada, North Dakota, Pennsylvania, South Dakota, and Wisconsin.

13th, Colorado, Iowa, Maine, Minnesota, Missouri, New Mexico, and Texas. 14th, Arkansas, Illinois, Indiana, Kentucky, Massachusetts, Missouri, New York, Ohio, and Oklahoma. 15th, Maine, Massachusetts, Michigan, Montana, New York, North Carolina, North Dakota, Ohio, Pennsylvania, and Vermont. 16th, Illinois, Michigan, North Carolina, South Dakota, and Wisconsin. 17th, North Dakota. 18th,



Colorado, Kansas, Maine, Nebraska, and Utah. 19th, Illinois, Iowa, Minnesota, Montana, Nebraska, and Wisconsin. 20th, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New York, Pennsylvania, South Dakota, Vermont, and Wisconsin.

21st, Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Missouri, New Hampshire, North Dakota, Ohio, Tennessee, Vermont, and Wisconsin. 22d, Indiana, Iowa, Massachusetts, Michigan, New York, Ohio, Vermont, and West

Virginia. 23d, Colorado, Montana, New York, and Ohio. 24th, Minnesota and Nevada. 25th, Colorado, Maine, Nebraska, Nevada, North Dakota, South Dakota, Vermont, and Wisconsin. 26th, Colorado, Iowa, Michigan, Minnesota, Montana, Nebraska, South Dakota, Utah, and Wisconsin. 27th, Michigan, Minnesota, and Wisconsin. 28th, Iowa, Maine, Michigan, Nevada, Utah, and Wisconsin. 29th, Colorado, Iowa, Kansas, Nebraska, Utah, and Wisconsin. 30th, Colorado, Indiana, Iowa, Kansas, Minnesota, Nebraska, and Wisconsin.

### WINDS.

The prevailing winds in April, 1893, are shown on Chart II by arrows flying with the wind. In New England, on the northeast slope of the Rocky Mountains, over the southern plateau region, and along the middle Pacific coast the winds were generally from southwest to northwest; in the middle Atlantic states, the Ohio Valley and Tennessee, and over the middle and northern plateau regions, from southeast to southwest; in the south Atlantic and east Gulf states, on the southeast slope of the Rocky Mountains, and along the north Pacific coast, from south to west; over the Florida Peninsula and in the west Gulf states, from east to south; in the upper lake region, from northeast to southeast; in the extreme northwest, from northwest to north; in the Missouri Valley, from northwest to northeast; along the south Pacific coast, from west to northwest; and in the lower lake region, the upper Mississippi valley, and on the middle-eastern slope of the Rocky Mountains, variable.

#### HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 2d, 56, sw., at Winnemucca, Nev. 3d, 72, s., at Fort Canby, Wash. 4th, 50, sw., at Detroit, Mich. 5th, 50, sw., at Winnemucca, Nev. 6th, 60, sw., at Salt Lake City, Utah; 58, sw., at Amarillo, Tex., Colorado Springs, Colo., and Winnemucca, Nev.; 52, sw., at Pueblo, Colo.; 51, sw., at Dodge City, Kans.; 50, w., at Fort Stanton, N. Mex.; 50, se., at Keeler, Cal. 7th, 63, sw., at Rapid City, S. Dak.; 60, w., at Pierre, S. Dak.; 60, nw., at Huron, S. Dak.; 59, se., at Erie, Pa.; 54, sw., at Lexington, Ky., and Amarillo, Tex.; 54, w., at North Platte, Nebr.; 52, sw., at Detroit, Mich.; 52, w., at Valentine, Nebr.; 50, w., at Cheyenne, Wyo.

11th, 66, w., at Amarillo, Tex.; 60, sw., at Hannibal, Mo.; 58, sw., at Dodge City, Kans.; 56, nw., at Kearney, Nebr.; 53, sw., at Wichita, Kans.; 52, nw., at Colorado Springs, Colo.; 50, nw., at El Paso, Tex. 12th, 58, se., at Chicago, Ill.; 54, sw., at Saint Louis, Mo.; 54, w., at Huron, S. Dak.; 52, sw., at Detroit, Mich., and Hannibal, Mo.; 50, sw., at Davenport, Iowa, and Red Wing, Minn.; 50, n., at Saint Vincent, Minn. 13th, 68, s., at Fort Canby, Wash.; 60, sw., at Detroit and Port Huron, Mich. 14th, 54, nw., at Galveston, Tex. 18th, 50, n., at Amarillo, Tex. 19th, 62, e., at Chicago, Ill.; 60, n., at Amarillo, Tex., and Kearney, Nebr.; 53, n., at Wichita, Kans.; 50, n., at Dodge City, Kans.

20th, 72, ne., at Detroit, Mich., and Chicago, Ill.; 66, s., at Charleston, S. C.; 60, se., at Block Island, R. I., and Sault Ste. Marie, Mich.; 60, w., at Lexington, Ky.; 57, w., at Pensacola, Fla.; 56, nw., at Kearney, Nebr.; 54, se., at Oswego, N. Y.; 54, nw., at Sioux City, Iowa; 53, s., at Fort Canby, Wash.; 52, se., at Erie, Pa.; 52, sw., at Port Huron, Mich.; 52, w., at Saint Louis, Mo.; 51, w., at Columbus, Ohio; 50, se., at Cleveland, Ohio; 50, ne., at Cheboygan, Mich.; 50, nw., at Leavenworth, Kans., Springfield, Mo., and Huron, S. Dak. 21st, 60, se., at Block Island, R. I.; 54, sw., at Nantucket, Mass.; 50, sw., at Chicago, Ill. 22d, 50, s., at Fort

Canby, Wash. 23d, 56, se., at Huron, S. Dak. 24th, 51, n., at Colorado Springs, Colo. 26th, 54, se., at Erie, Pa.; 52, sw., at Chicago, Ill. 27th, 54, sw., at Chicago, Ill. 30th, 53, ne., at Chicago, Ill.

#### LOCAL STORMS.

(75th meridian time is used at regular Weather Bureau stations.)

**3d.**—Near Fall Creek, Pittsylvania County, Va., 2 boys were killed by lightning. At Parkersburg, W. Va., a thunderstorm, with high southwest wind, occurred about 11 p. m., causing damage of a minor character. A destructive thunderstorm was reported at Berrien Springs, Mich. At Grand Haven, Mich., a heavy thunderstorm began in the early morning and continued until 10 a. m.; a flagstaff was struck by lightning. A thunder, rain, and hail storm moved northeast over Powhattan, Kans., about 4 p. m. In the afternoon a westerly gale caused some damage about Fort Buford, N. Dak.

**4th.**—A house was struck by lightning at Portland, Me. High wind the night of the 4-5th caused some damage at Albany, N. Y. Westerly gales interrupted traffic on the Straits at Sault Ste. Marie, Mich., and caused considerable damage to telegraph lines, etc. Damage by lightning was reported at Benzonia, Mich.

**5th.**—In the afternoon at Knoxville, Tenn., a house was struck and a boy killed by lightning.

**6th.**—At Chicago, Ill., a temporary hotel, valued at \$5,000, located near the World's Columbian Exposition, was blown down. The night of the 6th a thunderstorm caused considerable damage at North Marshall, Mich. Severe thunderstorms occurred in Jefferson, Racine, and Waukesha counties, Wis. In the afternoon a house in Saint Paul, Minn., was struck by lightning. At Denver Colo., a heavy windstorm prevailed in the afternoon and evening; telegraph lines were blown down, and one person was killed by a falling cornice. A southwest gale prevailed at Salt Lake City, Utah, and about 1.20 p. m. the wind reached a velocity of 60 miles per hour, the highest velocity on record at that station. Rain fell from 11.15 to 11.25 a. m. At 2.20 p. m. rain began and changed to snow, and snow ended 4 p. m. From 10 a. m. to 12.30 p. m. the temperature fell from 62° to 34°. Several persons were injured, and the damage to buildings was estimated at \$2,000.

**7th.**—A thunderstorm, with light rain, moved east of north over Westfield, N. Y., between 5 and 6 a. m., damaging outbuildings, roofs, etc., to the extent of about \$3,000. A storm of rain and sleet, changing to snow, began at Ithaca, N. Y., at 6 a. m. A thunderstorm, with heavy rain and high wind, moved northward over Jamestown, N. Y., at 7 a. m. A thunder, rain, and hail storm moving east was reported at Falconer, N. Y., at 7.15 a. m. At Springville, N. Y., a thunderstorm moved north at 7.30 a. m.; a barn was wrecked, killing one person and 4 head of cattle. A southerly gale prevailed at Dunkirk, N. Y., from 7 to 9 a. m. At Fredonia, N. Y., a light thunderstorm, moving north with heavy rain, began 6.30

p. m., 7th, and high winds continued until the morning of the 8th. Three thunderstorms, with rain and hail, visited Number Four, N. Y. At Erie, Pa., a thunderstorm moved east-northeast in the early morning, and a heavy southeast gale caused damage of a minor character to the extent of about \$5,000.

At Riley, Ill., hail and a heavy gust of wind from the southwest occurred at 3.30 p. m. A Romeoville, Ill., a destructive storm, with rain and hail, moved northeast in a path about 40 rods in width at 5.45 p. m.; 9 persons were reported killed and the destruction to property was placed at \$26,000. At 7 p. m. a thunder, rain, and hail storm moved east-northeast over Chicago, Ill., in a path about one mile in width; the damage to glass, by hail, was placed at \$100,000. During the day several structures near the World's Fair grounds were demolished by wind; loss about \$30,000. A thunderstorm, with rain and hail, moved north of east 3 miles south of South Haven, Mich., at 1.30 a. m. A number of persons were injured, and property was destroyed to the value of \$10,000 to \$20,000.

A heavy thunder and rain storm moved northeast over Lacota, Mich., at 3 a. m., damaging buildings to the extent of about \$25,000. At Detroit, Mich., a heavy thunderstorm, with some hail, occurred in the early morning. A second thunderstorm, with hail and heavy gusts of wind, began at night and continued until the early morning of the 8th; considerable damage by high wind was reported throughout the state. A heavy westerly gale prevailed over South Dakota. At Rapid City the wind reached a velocity of 63 miles per hour from the southwest, and the damage to buildings was placed at \$2,500. At Pierre, a velocity of 60 miles per hour was reached in the afternoon.

**8th.**—Severe thunderstorms occurred in New England in the afternoon and at night. At Solon, Me., a house was struck by lightning and burned. At Bethel, Me., the storm was attended by hail and flakes of heavy ice, and a stable was struck and a horse killed by lightning. At Fryeburg, Me., a railroad station was struck by lightning and burned. At North Conway, N. H., a thunder and hail storm began at midnight and continued until the morning of the 9th. Near Middleboro, Mass., a house was struck by lightning. In the late afternoon a thunderstorm moved east over Boston, Mass.

**9th.**—A heavy hailstorm prevailed at Oklahoma City, Okla., from 9 to 9.10 a. m.; some of the hailstones were as large as walnuts, and caused some damage to fruit trees.

**10th.**—A severe thunder, rain, and hail storm moved north of east over Albany, Tex., between 7 and 8 p. m.

**11th.**—Destructive local storms occurred throughout the Western States. From 11 p. m. to midnight a heavy rain and thunderstorm, with light hail, moved east over Centralia, Ill. At Springfield, Ill., a thunder and rain storm began in the evening and increased in intensity, with hail, after midnight. At Vandalia, Ill., a thunderstorm moved northeast about midnight, destroying property to the estimated value of \$12,000. A thunderstorm, with hail at intervals, occurred at Minneapolis, Minn., in the evening. At Granite Falls, Minn., a man was killed by lightning. At Bismarck, N. Dak., heavy snow and a severe northerly gale began in the evening and continued during the 12th; trains were delayed by drifted snow. The storm was one of the severest of the season over a great part of North Dakota. A heavy rain and hail storm was reported at Canton, S. Dak., about 3 p. m.

At Sioux City, Iowa, a heavy thunderstorm continued from 6 to 7 a. m., and high wind prevailed in the early morning. In the afternoon a heavy fall of hail was reported 5 miles southeast of Sioux City. At Akron, Iowa, the damage to buildings by wind was placed at \$50,000. A tornado moving east was reported near Westfield, Ohio, at 3.30 p. m. About 6 p. m. a tornado moved northeast in a path 300 yards in

width about 3 miles east of Fonda, Iowa, with heavy rain and some hail. A child was killed, and a number of small buildings valued at \$6,000 were destroyed. A tornado moving east of north in a path 100 yards in width was reported at Newton, Iowa, at 8 p. m. The storm had a whirling motion from right to left, and was preceded by rain and hail. Several persons were injured, and the value of property destroyed was placed at \$10,000. At Davenport, Iowa, a thunder and rain storm continued during the evening; the damage by rain was estimated at \$20,000.

Exceptionally severe storms occurred throughout central and northern Missouri in the evening. At Steeleville a heavy thunder, rain, and hail storm moving northeast prevailed from 6 to 6.45 p. m., and a second thunderstorm occurred at that place about 11 p. m. About 6.15 p. m. a thunderstorm moved northeast at Rolla, Mo., damaging frail buildings to the extent of \$2,000. About 7.30 p. m. a tornado appeared about  $\frac{1}{4}$  mile northeast of Mayview, Lafayette County, Mo., and moved in an irregular northeasterly course about 12 miles, destroying buildings in its path. The storm cloud presented a black funnel-shaped mass, with the point down; the crest of the cloud appeared to be ablaze, and the path of destruction varied in width from 70 feet to 500 yards. The tornado passed about 6 miles southeast of Lexington, Mo., in a path 20 feet to 300 yards in width. At that point the tornado was attended by a continuous roar of thunder and a constant glare of lightning, and had a whirling motion from right to left. Trees on the north side of the center of the track fell east, southeast, and south, those on the south side fell north and northeast, and in the center they lay with the course of the storm. The storm passed near Page about 7.15 p. m., in a path about  $\frac{1}{4}$  mile in width, with thunder and lightning, rain, and hail near the path. A heavy thunderstorm was reported at Dover at 7.30 p. m. The loss of life in Lafayette County, Mo., by this tornado was placed at 6; a number of persons were injured; and 15 buildings, valued at \$10,000, were destroyed.

At 6.30 p. m. a tornado moved northeast 6 miles northwest of Salem, Dent County, Mo., with thunder and lightning and heavy rain, killing 10 persons, and destroying buildings valued at \$20,000. A heavy rainstorm, with lightning and a northeast gale, visited Mexico, Audrian County, Mo., about 9 p. m.; in the county the damage was placed at \$3,000. A thunderstorm, with heavy rain, moved eastward over Washington, Mo., between 10 and 11 p. m. At Saint Louis, Mo., lightning was observed in the northwest and southwest at 6.50 p. m., and increased in frequency and intensity until 7.55 p. m., when thunder was heard and heavy rain began to fall, with hail from 9.15 to 9.30 p. m. About midnight the wind increased to a gale from the southeast. At 1 a. m. a heavy, dark cloud was observed approaching from the southwest, and passed directly over the city, with torrents of rain, and wind 54 miles per hour from the southwest. The pressure oscillated .20 inch, as shown by the barograph record, apparently first increasing .15 and then decreasing .20 inch from the highest point. The storm was exceptionally sudden and severe and caused considerable damage in and about the city and on the river.

At Hannibal, Mo., the wind was brisk from the south during the day. At 9.30 p. m. the wind increased to 30 miles per hour, and at 11.33 p. m. reached 60 miles per hour from the southwest, and maintained that velocity for 5 minutes, with heavy thunder and vivid lightning. Considerable damage of a minor character was caused in and about the city. A heavy thunderstorm, with small hail, visited Hartington, Nebr. Between 3 and 4 p. m. a thunderstorm, with heavy rain and hail, moved northeast over Little, Nebr., killing some stock and damaging property to the extent of \$2,000. Near Stafford, Nebr., several persons were injured and a num-



ber of buildings were destroyed. At Cedar Creek, Nebr., a thunder, rain, and hail storm moved northeast at 3.45 p. m., damaging property to the estimated value of \$5,000. A heavy thunder and hail storm, with light rain, moved northeast near Inman, Nebr., at 3.45 p. m., seriously injuring one person and blowing down 19 small buildings. Frail buildings were destroyed near Ponca, Nebr., by a thunderstorm.

A hailstorm moved north at Plainview, Nebr., at 4 p. m. A destructive storm passed across the southeast part of Holt County, Nebr., about 4 p. m., injuring a number of persons and destroying farm buildings. At Omaha, Nebr., a thunderstorm, with rain and hail, occurred in the early morning. At 5.49 p. m. a severe thunderstorm, with heavy rain and hail, caused considerable damage of a minor character. About 2.30 p. m. a heavy rain and hail storm, with thunder and lightning, moved northeast near Beaumont, Kans., destroying several barns. In the afternoon a man was killed by lightning at Robinson, Kans. A violent thunder, rain, and hail storm visited Muscotah, Kans., at 4.15 p. m., injuring several persons, and destroying property valued at \$10,000. At Everest, Kans., a thunderstorm, with rain and hail, moved northeast at 4 p. m.; one person was killed near Everest, and some damage was caused by hail. During a thunderstorm which visited Altoona, Kans., about 5 p. m. hail the size of walnuts fell. At 5.30 p. m. a tornado, with thunder, lightning, and hail, moved northeast over Parker, Kans., in a path 300 to 400 feet in width, destroying property to the extent of \$100,000.

A hailstorm, with high wind, destroyed outbuildings at Parsons, Kans., at 6.25 p. m. Damage by high wind was reported at Concordia, Kans. A wind, rain, hail, and thunder storm began at Keesees Ferry, Ark., at 10 p. m. At 7 p. m. a thunder, rain, and hail storm moved east over Paris, Tex., damaging property to the value of \$10,000. A rain and hail storm visited Petty, Tex., at 7 p. m., injuring 3 persons and damaging property. Considerable damage was caused by hail near Albany, Tex., between 7 and 8 p. m. A heavy thunder and hail storm moved southeast over Brookston, Tex., at 7.30 p. m. A rain, hail, and thunder storm moved eastward over Oak Cliff, Tex., at 9 p. m., destroying property valued at \$10,000. High wind caused considerable damage about Dallas, Tex. At 9.10 p. m. a severe thunderstorm, with hail and heavy rain, moved east over Dallas in a path 100 to 150 feet in width, uprooting trees and unroofing houses. A thunderstorm moved northeast over Mount Vernon, Tex., at 11 p. m., causing damage of a minor character.

**12th.**—Severe local storms occurred in the Ohio and Mississippi valleys and the upper lake region. A thunder, rain, and hail storm moved northeast over Vian, Ind. T., at 6.30 p. m. A rain and hail storm moved northeast 4 miles south of Newellton, La., at 4 p. m., killing one person, injuring several, and destroying property valued at \$10,000. A thunderstorm, with hail and heavy rain, moved northeast over Water Proof, La., about 4.15 p. m., causing damage in a path 400 feet in width. A violent thunder, rain, and hail storm moved northeast over Baldwyn, Miss., at 12.30 a. m., killing one person and destroying property to the extent of \$15,000. A thunder and hail storm moved east over Robinsonville, Miss., at 4.30 p. m., killing 12 persons and destroying property to the extent of \$25,000. Considerable damage to buildings was caused by a thunder, rain, and hail storm which passed northeast over Lewisburg, Miss., at 4.30 p. m.

A severe thunderstorm, with heavy rain and hail, moved southeast over Corinth, Miss., about 7 p. m., causing considerable damage of a minor character. A violent thunder, rain, and hail storm visited Sheffield, Ala., at 9 p. m. A heavy thunderstorm, with rain and hail, passed northeast over Brownsville, Tenn., about 4 p. m.; timber was blown down, and several persons were injured by a falling house. Trees

and houses were prostrated by a thunderstorm that moved eastward over Jackson, Miss., at 4.30 p. m. Some damage was caused by hail at Covington, Tenn. Heavy rain, hail, and thunder storms were noted at Watertown, S. Dak., in the afternoon and evening. Westerly gales prevailed in the upper Mississippi valley. A thunderstorm passed northeast over Breese, Ill., in the early morning. A thunderstorm, with heavy rain and hail, visited Marshall, Ill., about 3 a. m.

A southeast gale demolished a number of small buildings in the southern part of Chicago, Ill. A heavy thunderstorm, with rain and small hail, moved northeast over Terre Haute, Ind., at 2.30 a. m., damaging buildings to the extent of \$5,000. A heavy rainstorm, with vivid lightning, passed northeast over Greencastle, Ind., at 3 a. m. Between 3 and 4 a. m. considerable damage was caused at Thorntown, Ind., by a thunder and rain storm. At Kokomo, Ind., a storm moved northeast in a path 150 feet in width at 4 a. m., killing one person and damaging property to the value of \$5,000. A thunder and rain storm, with heavy hail, moved northeast near Wilkinson, Ind., about 9 p. m.; the path was 300 yards in width, and the estimated value of property destroyed was \$4,000. A severe thunderstorm visited Findlay, Ohio, and vicinity from midnight to 3 a. m. Unusually severe local storms occurred in southeastern Lower Michigan in the evening.

A heavy thunder, rain, and hail storm, with high wind, prevailed at Adrian, Mich., between 7 and 8 p. m. About 7.30 p. m. a destructive storm passed northeast over Dundee, Mich., killing one person, and destroying 50 buildings valued at \$50,000 to \$75,000. At Rea, Mich., a storm moved northeast in a path 10 rods in width at 8.10 p. m., with sharp lightning and heavy thunder before its arrival, and rain and hail outside the path of destruction. At that place one person was reported killed, and many buildings were blown over. About 7 p. m. a tornado moved northeast over Ypsilanti, Mich., in a path 200 to 500 feet in width, attended by vivid lightning, continuous thunder, and heavy rain; the value of property destroyed in Ypsilanti was placed at \$100,000. At Detroit, Mich., a thunderstorm began 8.45 p. m. and ended 9.15 p. m., and a light thunderstorm continued from 10.45 to 11.30 p. m. The wind was high at intervals during the evening, and reached a velocity of 52 miles per hour from the southwest at 9.21 p. m.

A thunderstorm passed northeast near Redford, Mich., at 7.45 p. m., damaging property to the extent of \$6,000. A thunderstorm moving northeast visited Beech, Mich., about 8 p. m. A violent thunder, hail, and rain storm passed northeast over Royal Oak, Mich., at 7.30 p. m., in a path 80 rods in width, killing 2 persons, and destroying property to the value of \$50,000. At Utica, Mich., 40 buildings were injured or destroyed by a thunder, rain, and hail storm which passed northeast over that place about 7.30 p. m. Some damage was reported near Romeo, Mich. A thunder and rain storm moving east visited Lexington, Mich.; west of that place a barn was struck by lightning and burned.

**13th.**—A violent thunderstorm, with hail and heavy rain, moved northeast over Fort Smith, Ark., at 6 p. m., unroofing a number of buildings. A heavy thunderstorm, with high wind, rain, and hail, began at Little Rock, Ark., 9.20 p. m.; some damage was caused by hail. A severe thunder, rain, and hail storm was reported at Exeter, Mo. At Springfield, Mo., heavy hail began 2.04 p. m., and continued 9 minutes. The hailstones were very large and caused great damage to fruit blooms and vegetation. Fruit and crops were damaged by a thunder and hailstorm which moved southeast over Poplar Bluff, Mo., at 4.30 p. m.

**14th.**—Severe local storms occurred in the Southwestern States. At San Antonio, Tex., a thunder and rain storm moving east, with some hail, began 6.15 and ended 7.25 a. m.;

a number of houses were blown down, and others were unroofed. A heavy thunderstorm moved east over Houston, Tex., at 8 a. m., destroying property valued at \$5,000. Destructive gales were reported over southern Louisiana about noon. Two persons were reported killed in La Fourche Parish and one in Terre Bonne Parish, and the destruction of property was estimated at \$15,000. About 6.30 a. m. a thunderstorm moved northeast over Robeline, La., causing damage of a minor character. During a thunder and rain storm at Grand Cane, La., in the evening stock was killed by falling timber. A thunderstorm, with heavy rain and some hail, was reported at Houma, La., at 1.30 p. m.; the damage to buildings was placed at \$8,000.

At New Orleans, La., a thunderstorm began 2.56 and ended 4 p. m., and high winds, reaching a velocity of 48 miles per hour, continued from 3 to 3.30 p. m. A heavy thunder and rain storm moved southeast over Lonoke, Ark., at 8 p. m., unroofing buildings and prostrating shade trees. A thunder and rain storm moving east prevailed at Vicksburg, Miss., from midnight to 3 a. m. High wind caused damage about Duck Hill, Miss. During a thunderstorm in the early morning at Nashville, Tenn., a house was struck by lightning and electric wires were burned out. About 4 p. m. a tornado moved north of east near Henderson, Tenn., with loud thunder, vivid lightning, and heavy rain. The tornado had a whirling motion, and was attended by a terrific roaring sound. Many houses were wrecked, trees were stripped of bark to a height of 20 feet, and stumps and posts were pulled out of the ground.

**16th.**—A heavy rain and thunder storm began at Jupiter, Fla., at 2.45 p. m. and ended 8.05 p. m.; 2.20 inches of rain fell, and hail was reported near Jupiter.

**18th.**—An unusually heavy rainstorm, with thunder, prevailed at Galveston, Tex., during the evening and until the early morning of the 19th. A light rain and hail storm, with lightning, moved northeast over Boles, Ark., at 10 a. m., blowing down dwellings and trees. A thunder, rain, and hail storm moved southeast over Osage City, Kans., at 4.30 p. m., killing one person, and destroying a number of small houses valued at \$12,000. A rainstorm, with very large hail, passed northeast over Osawatomie, Kans., at 7.30 p. m. In the early morning a house was struck by lightning at Concordia, Kans. Several houses about Sedan, Kans., were destroyed by high wind. In the evening a heavy hailstorm was noted at Hebron, Nebr. A heavy hailstorm was reported at Lebanon, Mo., in the evening, and many farms in that section were badly washed by heavy rain.

**19th.**—Destructive storms were reported in the Southern States, the Mississippi Valley, and the upper lake region. At Galveston, Tex., a thunderstorm, with rain and high wind from the south, prevailed in the early afternoon. A severe storm visited the southern part of Terre Bonne Parish, La.; at Houma the rainfall was 4.72 inches in 21 hours. A destructive wind and hail storm occurred in the north part of Union Parish, La. A severe storm passed near Meridian, Miss., about 6 p. m. Heavy rain and some hail fell, and thunder was heard as the storm approached. Two persons were killed, 150 dwellings in the county were destroyed, and great damage was caused to farm lands. A thunderstorm, with heavy rain and large hail, moved northeast  $\frac{1}{2}$  mile east of Pachuta, Miss., at 6.45 p. m. In a path 2 to 4 miles in width and 40 miles in length 250 dwellings were destroyed, and 3 persons were reported killed in Jasper County and 2 in Clarke County.

At Auburn, Ala., a thunderstorm began 5 p. m., and a heavy storm of wind and rain, with thunder and lightning, prevailed from 2 to 3 a. m., 20th. At 8 p. m. a tornado, with heavy rain, moved northeast near Pushmataha, Ala.; the storm had a whirling motion from right to left; the path

was 300 yards in width; several persons were injured, and a number of buildings were blown down. A destructive storm moved northeast over Midland City, Ala., at 11 p. m. Destructive thunder, wind, rain, and hail storms were reported in Florida. At Apalachicola small craft were capsized and larger vessels were damaged. Serious damage was reported in the afternoon about Bristol. Considerable damage was caused to timber, crops, etc., about Lake City, Federal Point, Green Cove, Fla., and Piscola, Ga. A heavy thunder and hail storm, with light rain, moved northeast near Prairie Grove, Ark., at 11.30 a. m. The storm had a whirling motion from right to left; its path was 200 feet in width, and 10 buildings, besides outhouses, were destroyed.

A violent wind and rain storm, with small hail, visited Fort Smith, Ark., about noon. A tornado, with funnel-shaped cloud, moved northeast at Flowery, Ark., about noon, destroying buildings in a path 200 yards in width, and killing one person. Thunderstorms occurred at Springfield, Mo., in the morning and afternoon, the afternoon storm being attended by small hail. In the evening rain, with a northwest gale, prevailed. Destructive gales, with thunder and hail storms, occurred in eastern Kansas. Some damage was caused by hail, and heavy rain caused washouts on railroads. Heavy gales prevailed over Kentucky and Illinois, with heavy rain at intervals. Over northern Illinois hard gales continued during the 20th and 21st, with snow flurries the afternoon of the 20th. Heavy gales prevailed over Minnesota, and an exceptionally heavy snowstorm set in over central and northern Minnesota in the evening and continued during the 20th. Over western Wisconsin gales and snow continued during the 20th. Heavy gales continued over the upper lakes during the 19th and 20th.

**20th.**—Destructive storms occurred in the Atlantic coast states, the Lake region, and the Ohio and upper Mississippi valleys. Easterly gales at night caused considerable damage in the middle Atlantic and west New England states and the lower lake region. Snow fell in southern New England in the morning. At Malone, N. Y., the gale was attended by thunder. A thunderstorm was reported at Harrisburg, Pa., at 10.20 p. m. Damage by high wind was reported in North Carolina. At Charleston, S. C., a southerly gale was attended in the morning by thunder and lightning. Damage to early cotton was reported in parts of South Carolina. A southeast gale and destructive local storms were reported in Georgia in the early morning. At Chipley, Ga., a heavy thunder, rain, and hail storm moved east of north in a path about 150 yards in width at 2 a. m., destroying property to the value of about \$2,000. A heavy thunder and rain storm moved northeast over Albany, Ga., about 2 a. m. Between 5 and 6 a. m. a thunderstorm moved northeast 10 miles south of Alapaha, Ga., blowing down a number of frame houses; one house was struck by lightning.

A heavy rain, wind, and thunder storm damaged crops about Quitman, Ga. At Poulan, Ga., a house was wrecked and one person fatally injured. Severe thunder, rain, and hail storms occurred in Florida. At Pensacola a building was struck by lightning, and the wind reached a velocity of 57 miles per hour. At Jacksonville 1.70 inch of rain fell in 1 hour and 6 minutes. At Port Tampa waves swept over the railroad tracks. Unusually severe storms prevailed over the Lake region; a number of marine disasters were reported, and heavy rain flooded streams and damaged crops. At Detroit, Mich., the wind reached a velocity of 72 miles per hour from the northeast. At Milwaukee, Wis., a shed on a crib which extended into the Lake was washed away and 15 men were drowned; considerable damage was also caused to the Government Breakwater. Heavy snow fell at Red Wing, Minn. Snow and high northwest winds prevailed over Iowa. Heavy rain and high winds prevailed on the north Pacific coast.



**21st.**—Destructive windstorms prevailed in the Atlantic coast states. At Groveton, N. H., a hotel in course of erection was blown down; estimated loss \$17,000. A heavy thunderstorm, with small hail, was reported at Titusville, Fla., in the early morning.

**23d.**—A heavy hail and thunderstorm occurred at Jupiter, Fla., in the early afternoon; the hailstones measured one inch in diameter and injured pineapples. The hailstorm covered an area of about 25 miles. In the afternoon a thunderstorm, with hail, and rain changing to snow, occurred at Salt Lake City, Utah. Streets in the southern part of the city were flooded, lightning struck the power-house of the street car company, and the temperature fell from 62° to 33°.

*Tornado in Cleveland County, Okla., April 25, 1893.*

The following is the substance of a report made by Mr. J. I. Widmeyer, Observer, Weather Bureau, Oklahoma City, Okla., on the tornado which visited Cleveland County, Okla., the evening of April 25th:

At Oklahoma City, 14 miles north of the section visited by the tornado, the afternoon was warm and sultry, with barometer low and unsteady, and wind fresh from the southeast. Heavy rain began 6.45 p. m. (75th meridian time), and ended 8.20 p. m., the depth of rainfall being 0.68 inch. At 10.30 p. m. the wind veered to south-southwest, and then to northwest. Before the sky became obscured by nimbus clouds from the southeast, cirrus and cirro-cumulus clouds were observed moving rapidly towards the southeast. At Norman, Cleveland County, light rain, with small hail, began 5 p. m. (90th meridian time), and was followed at 5.35 p. m. by a sudden heavy fall of rain and strong southeast wind. Immediately following the heavy rain the tornado was distinctly visible south of Norman, moving rapidly northeast. The storm was in view about 10 minutes, and broke up when about due east of the town, without having caused material damage. The funnel or center appeared like a spout lowered from the clouds, and was of a peculiar gray color. But little lightning was observed. About the time the first storm disappeared another cloud formed in the west. This cloud increased rapidly in size, and at 6.25 p. m. moved rapidly in a northeast direction, causing great loss of life and destruction of property. The appearance of the clouds attending this storm was remarkable. The outer clouds seemed to be driven furiously in to the center. No spout or funnel, and but little lightning, was observed, and no roaring sound was noted. In about 20 minutes the storm had disappeared in a northeast direction.

About 6 p. m. a heavy, dark cloud was observed 5 or 6 miles southwest of Moore, Okla. The cloud appeared to remain almost stationary, and was joined by other clouds which advanced from the northwest and southeast. These clouds appeared to dart quickly into the top, and become a part, of the larger cloud. About 6.30 p. m. the cloud began to revolve slowly from right to left and moved north of east with a sullen roar. The edges of the cloud seemed luminous, although no lightning was seen nor thunder heard. After crossing the Canadian River several "twisters" descended from the main cloud. These spouts, except one long one which trailed 50 to 100 yards behind the main cloud and swung to and fro, would disappear and others would replace them. The tornado was preceded by heavy rain, and a few large hailstones fell at Moore, 1½ miles from the path of the storm, and one hailstone struck a child on the head, breaking its skull. The first house struck by the storm contained 13 persons, 11 of which number were killed. The house was torn to pieces and the debris scattered over several acres of ground to the southeast. The few fence posts left standing were covered with mud. The supposition is that in crossing the river the storm sucked up quantities of water and sand or mud and deposited them on the edges of its path. An orchard northeast of the house was stripped of every twig and branch and many of the trees were completely stripped of bark. The orchard looked as though a fire had burned over it. About one-half mile south of this house a house and barn were scattered over several acres toward the northeast, and four persons were killed. About one mile northeast of the last-mentioned house a house was torn to pieces and the debris thrown southeast and northwest, and 6 persons were killed. A house one-half mile north of that point was demolished and the debris thrown south. In a wheat field between the points last named the wheat was blown close to the ground and lay pointing southeast, while debris from a house to the southeast was scattered over the field. In many places pieces of boards and scantling from the house to the southeast were driven deep into the ground. Two houses one-half mile south of the wheat field were scattered toward the north and northeast. The path of destruction was about one-half mile in width. Wire fences were rolled up into great balls. In a number of instances spokes were torn from wagon hubs, and in each instance, save one, the hubs were torn from the axle. In that instance the spokes and tire were carried away. Harrows with their teeth in the ground were undisturbed. The observer states, on the authority of a physician who had examined 14 dead bodies, that the persons killed were invariably injured on the left side of the face and body, and some had the appearance of having been burned. Thirty persons, in all, were killed by this storm and many were injured. Many of the houses destroyed

were small, frail structures, and probably \$25,000 would cover the loss to buildings in Cleveland County.

**25th.**—Tornadoes and heavy thunderstorms occurred in the Southwest. Near Case, Okla., about 10 miles northeast of Norman, a tornado moved northeast about 5.30 p. m. About 4.45 p. m. a tornado moved north-northeast about 3½ miles east of Case. Near Cimarron, Payne County, a tornado moved northeast at 3.30 p. m., destroying everything in its path. A tornado moved east one mile north of Perkins, Payne County, at 3.30 p. m. This tornado was followed by heavy rain and large hail, and some thunder and lightning. In a path 10 miles in length and averaging 80 rods in width 60 buildings were torn to pieces, 2 persons were killed, and two fatally injured; debris was thrown in all directions, limbs and bark were stripped from trees, and an ordinary square spade was carried 150 feet and driven into a solid oak tree one-half the length of the blade.

A tornado, moving northeast, was reported near Ransom, Payne County, about 5 p. m. At Langston, Logan County, a heavy thunder, rain, and hail storm moved southeast at 3 p. m., killing two persons. A tornado moved northeast near Bonita, Montague County, Tex., at 8.45 p. m., with sharp lightning, rain, and hail. In a path 75 to 250 yards in width 11 houses were torn to pieces, and 2 children were killed. This storm crossed the Red River 11 miles northeast of Bonita. A tornado, moving northeast, was reported 5 miles west of Saint Jo, Montague County, at 10 p. m. Heavy thunder, hail, and rain storms occurred in Arkansas. Three miles south of Winslow, Ark., 2 houses were blown down and stock was killed. A tornado was reported in the northwest part of Clay County, Ark., in the early morning.

About 8 p. m. a heavy thunder and rain storm damaged frail buildings and fruit trees north of Carthage, Mo. A destructive storm occurred east of Marion, Kans., about 3.20 p. m.; 2 houses were unroofed, and a barn was wrecked. Five miles east of Emporium, Kan., a house was struck by lightning. In the evening a house in Sioux City, Iowa, was struck by lightning. In Connersville, Ind., a flouring mill was struck by lightning and burned. At Lexington, Ky., a thunderstorm continued during the night of the 25-26th. At Nicholasville, Ky., a house was struck by lightning and burned. At 3.30 p. m. a heavy thunder, rain, and hail storm moved east over Miller, Miss., destroying about 20 houses, and prostrating timber.

**26th.**—In the morning a thunder and rain storm damaged crops about Melbourne, Ark. A thunder, rain, and hail storm moved northeast at Wabash, Ind., at 7.45 p. m. A very destructive storm appeared in the southwest part of Grant County, Ind., about 8 p. m., and leveled houses, timber, etc., in a path a few rods in width and about 20 miles in length. During a thunderstorm in the evening at Maysville, Ala., 3 horses were killed by lightning. A heavy wind and rain storm prevailed at night over northwestern Pennsylvania. In the evening lightning struck and fired a building in Grand Haven, Mich.; loss \$2,000. A northeast gale, with heavy, moist snow, began at Duluth, Minn., in the early morning. A storm of wind, thunder, and lightning passed over Leipsic, Ohio, in a path about 500 feet in width, at 11 p. m., lifting roofs, destroying outhouses, etc.

**27th.**—High winds caused considerable damage in north-west Ohio in the morning. A heavy thunder and rain storm visited Knoxville, Tenn., about 12.20 a. m. A violent storm damaged crops and timber about Greensburg, La., in the afternoon.

**28th.**—A tornado moved northeast over Cisco, Tex., at 9.30 p. m., in a path about three-fourths of a mile in width and 13 miles in length, with forked lightning, heavy rain, and large hail, killing 22 persons, and destroying property to the estimated value of \$400,000. About 6 p. m. a large fun-

nel-shaped cloud formed 5 miles southeast of Ponca, Okla., and moved southeast to a point 11 miles southeast of Ponca, where 6 persons and a quantity of stock were killed. Heavy rain on the 28th and 29th damaged farms about Lebanon, Mo. Heavy hail damaged fruit, etc., about Saint Charles, Mo. At Hannibal, Mo., hail fell from 11.20 to 11.25 a. m., and the hail was followed by a northeast gale. Damage by hail was reported at Farmland and Muncie, Ind. A thunder and hail storm occurred at Plant City, Fla., in the evening.

**29th.**—A heavy gust of wind, with thunder, sharp lightning, and rain occurred at Norfolk, Va., in the evening. Near Berkeley, Va., 2 children were killed by lightning. In the early morning a house in Cincinnati, Ohio, was struck by lightning. A stable was struck by lightning in Saint Louis, Mo. Six persons were drowned and property was destroyed

by flood near Winslow, Ark. During the 29th and 30th a heavy snowstorm prevailed in Millard, Beaver, and Iron counties, Utah.

**30th.**—A thunderstorm, with rain and hail, moved southeast over Wheeling, W. Va., at 5.15 p. m. A thunderstorm, with heavy rain, occurred at Cincinnati, Ohio, in the evening; great damage was caused by flood in the Mill Creek and Miami valleys. At Wyoming, near Cincinnati, a church steeple was demolished by lightning. A destructive storm was reported near Annapolis, Ohio. Late in the afternoon a violent thunderstorm moved from the southwest over Louisville, Ky. At 6.30 p. m. the wind reached an extreme velocity of 54 miles per hour. A destructive storm, with rain and hail, visited Eola, La., at 9 p. m., demolishing houses, uprooting trees, and damaging crops.

### INLAND NAVIGATION.

#### STAGE OF WATER IN RIVERS.

The following table shows the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence; and the monthly ranges:

*Heights of rivers above low-water mark, April, 1893.*

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Shreveport, La. ....	29.9	19.4	1	12.1	17-19	7.3
<i>Arkansas River.</i>						
Fort Smith, Ark. ....	22.0	24.2	30	2.9	10, 11	21.3
Little Rock, Ark. ....	23.0	19.9	30	6.6	12, 13	13.3
<i>Missouri River.</i>						
Fort Buford, N. Dak. * ..	13.1	7	7-9	27, 28	5.2	
Pierre, S. Dak. ....	14.0					
Sioux City, Iowa ....	18.7	15.4	11	6.6	1	8.8
Omaha, Nebr. ....	18.0	15.1	12	7.1	2	8.0
Kansas City, Mo. ....	21.0	18.1	14	9.1	1	9.0
<i>Mississippi River.</i>						
Saint Paul, Minn. ....	14.0	12.4	30	7.3	1	5.1
La Crosse, Wis. † .....	11.8	10.5	8, 9	7.4	3	3.1
Dubuque, Iowa ....	16.0	14.6	23, 24	6.2	1, 2	8.4
Davenport, Iowa ....	15.0	12.2	24	5.5	4	6.7
Keokuk, Iowa ....	14.0	13.7	26, 29, 30	7.6	5	6.1
Hannibal, Mo. ....	17.0	15.6	30	9.0	7, 8	6.8
Saint Louis, Mo. ....	30.0	29.0	30	15.9	16	13.1
Cairo, Ill. ....	40.0	43.7	23, 24	23.9	10	19.8
Memphis, Tenn. ....	33.0	32.9	30	17.4	12, 13	15.5
Vicksburg, Miss. ....	41.0	40.8	30	30.0	17	10.8
New Orleans, La. ....	13.0	13.8	1, 2	10.0	18, 20, 21	3.8
<i>Ohio River.</i>						
Parkersburg, W. Va. ....	38.0	24.4	24	8.2	5	16.2
Cincinnati, Ohio ....	45.0	42.8	30	15.6	6	27.2
Louisville, Ky. ....	24.0	15.7	30	7.0	7	8.7
<i>Cumberland River.</i>						
Nashville, Tenn. ....	40.0	24.8	17	5.8	5, 6	19.0
<i>Tennessee River.</i>						
Chattanooga, Tenn. ....	33.0	12.1	15	4.8	13	7.3
<i>Monongahela River.</i>						
Pittsburg, Pa. ....	29.0	18.1	22	5.5	1	12.6
<i>Savannah River.</i>						
Augusta, Ga. ....	32.0	13.1	22	6.1	20	7.0
<i>Willamette River.</i>						
Portland, Oregon ....	15.0	10.4	4-6	6.4	18, 19	4.0
<i>Susquehanna River.</i>						
Harrisburg, Pa. ....	17.0	10.9	23	5.2	30	5.7
<i>Alabama River.</i>						
Montgomery, Ala. ....	48.0	11.2	21	4.7	14	6.5
<i>James River.</i>						
Lynchburg, Va. ....	18.0	6.0	28	0.8	16	5.2
<i>Sacramento River.</i>						
Red Bluff, Cal. ....	21.4	6	6	5.5	20, 21	14.9
Sacramento, Cal. ....	25.2	8	23-3		22	1.9

\* For 24 days. † For 28 days.  
‡ Carrollton gauge readings from 4th to 30th, inclusive.

#### FLOODS.

On the 10th the Missouri River reached 15.7 feet at Sioux City, Iowa, damaging the construction work of the Pacific Short Line Bridge to the extent of \$5,000. Disastrous overflows of streams were reported in Minnesota and North Dakota. From the 28th to the 30th the Arkansas River rose rapidly at Fort Smith, Ark., and bottom lands in that section were submerged. At the close of the month the Mississippi

River was high and rising rapidly throughout its course. The Ohio, Wabash, and Arkansas rivers were also rising rapidly.

#### ICE IN RIVERS AND HARBORS AND OPENING OF NAVIGATION.

Navigation opened at Charlotte, N. Y., on the 1st, at Oswego, N. Y., on the 5th, and at Buffalo, N. Y., on the 15th. Navigation between Sandusky, Ohio, and Detroit, Mich., opened on the 10th. A steamer from Detroit arrived at Port Huron, Mich., on the 1st, opening navigation on the Saint Clair River. On the 3d a steamer left Port Huron for Sand Beach, opening navigation to that point. On the 9th a steamer arrived at Port Huron from Oscoda, Mich.; this was the first arrival of the season from a northern port. The first through boat of the season from Chicago, Ill., arrived at Port Huron on the 18th. On the 2d the river and bay at Alpena, Mich., were free from ice. At Sault Ste. Marie, Mich., ferryboats began running on the 18th. The boats landed at the lower dock, the upper dock being obstructed by ice. On the 28th ice moved from Mud Lake and Whitefish Point, leaving the river at Sault Ste. Marie free from ice. On the 29th a tug arrived at Sault Ste. Marie from Port Huron, opening navigation. On the 29th and 30th the river at Sault Ste. Marie was full of floating ice. Navigation opened at Manistee, Mich., on the 1st. High wind on the 12th cleared the Straits of ice at Cheboygan, Mich., and a schooner sailed for Drummonds Island; this was the first departure of the season. On the 18th a steamer from Detroit arrived at Cheboygan; this was the first arrival of the season. The harbor was reported clear of ice and navigation opened at Ludington, Mich., on the 7th. On the 18th a steamer from Chicago, bound for Buffalo, passed through the Straits of Mackinac. Considerable drift ice was encountered. The first boat of the season, excepting the regular winter-line boats, arrived at Grand Haven, Mich., on the 4th. At Green Bay, Wis., ice in the river was melting rapidly on the 2d, with spaces of clear water; 3d, river clear of ice, except near the shore; 13th, bay clear of ice; 17th, the first departure of the season; and 18th, the first arrival of the season. Navigation opened at Milwaukee, Wis., on the 13th, and at Chicago, Ill., on the 17th.

Ice went out of Lake Champlain at Burlington, Vt., on the 13th, and navigation at that port was resumed on the 17th. The Lake was reported clear of ice from Whitehall to Rouses Point on the 25th. The Kennebec River opened at Gardiner, Me., on the 12th. Navigation opened on the upper Saint Lawrence River by the 13th. The Fox River, Wisconsin, opened to the bay on the 3d, and the first steamer of the season passed through the locks on the 9th. Ice passed out of the Saint Croix River, Wisconsin, on the 10th. On the 25th the first



steamer of the season passed up the Saint Croix River at Hudson, Wis. Ice in the Red River of the North began to move at Grand Forks, N. Dak., on the 19th, and navigation opened at that point on the 26th. Ice ran out of the Minnesota River at Granite Falls, Minn., on the 6th.

*Mississippi River.*—At Minneapolis, Minn., ice was passing out of the river on the 2d; 3d, river rising and nearly clear of ice; 5th, a boom 5 miles above the city gave way, and large quantities of ice and logs passed Minneapolis. At Saint Paul, Minn., ice passed out on the 2d, and on the 30th the first boat of the season from Saint Louis, Mo., arrived. At Red Wing, Minn., ice was moving on the 2d; 3d, ice on Lake Pepin reported unsafe for teams; 6th, river clear of ice, and ferryboats resumed trips; 26th, the first raft boat of the

season passed down the river; 28th, the first up river boat of the season passed Red Wing. The river was clear of ice at Saint Cloud, Minn., on the 16th. At La Crosse, Wis., ice began to move on the 2d; 4th, river nearly clear of ice and rising rapidly; the first boat of the season passed through the bridge; 7th, the first boat of the season for up river ports arrived.

*Missouri River.*—On the 1st the river was high and rising and the ice very rotten at Fort Buford, N. Dak.; 2d, ice gorge opposite the Post broke, and ice ran out rapidly. Ice broke and navigation opened at Bismarck, N. Dak., on the 3d. Ice broke at Pierre, S. Dak., on the 1st; 2d to 10th, running ice; 17th, a steamer passed up the river; 28th, the first steamer of the season from Bismarck, arrived.

## ATMOSPHERIC ELECTRICITY.

### THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 21, on the 3d, 6th, and 8th; in 15 to 20 on the 4th, 5th, 7th, 9th to 14th, 18th, 19th, 20th, 25th, 26th, 28th, 29th, and 30th; in 10 to 14 on the 2d, 15th, 17th, 24th, and 27th; and in 5 to 9 on the 1st, 15th, 21st, 22d, and 23d. There were no dates on which thunderstorms were not reported.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 26, in Illinois; on 20 to 25 in Indiana, Kansas, Missouri, North Carolina, Ohio, and Texas; on 15 to 19 in Alabama, Arkansas, Florida, Iowa, Kentucky, Michigan, Mississippi, Pennsylvania, Tennessee, and West Virginia; on 10 to 14 in Louisiana, Maryland, Nebraska, New Jersey, New York, Virginia, and Wisconsin; on 5 to 9 in Connecticut, Massachusetts, Minnesota, Oklahoma, South Carolina, South Dakota, and Vermont; and on one to 4 in Delaware, District of Columbia, Indian Territory, Maine, New Hampshire, North Dakota, and Rhode Island.

West of the Rocky Mountains thunderstorms were reported in California on the 6th, 9th, 22d, and 27th; in Colorado on the 11th, 18th, 22d, 25th, 28th, and 29th; in Idaho on the 22d; in Nevada on the 22d, 23d, and 30th; in New Mexico on the 30th; in Utah on the 22d to 26th, 29th, and 30th; in

Washington on the 3d, 5th, 16th, 22d, and 26th; in Wyoming on the 6th and 7th. In states and territories other than those named no thunderstorms were reported.

### AURORAS.

Auroras were reported as follows: 3d, Turin, N. Y. 4th, South Canistoe, N. Y. 5th, Camp Dennison, Ohio. 6th, Eastport and Lewiston, Me. 7th, Ada, Minn.; Ericson, Nebr. 8th, Blue Hill, Mass. 9th, Valley Junction, Wis. 11th, Storrs, Conn.; Bar Harbor, Cornish, Eastport, Gardiner, Houlton, Lewiston, and Presque Isle, Me.; North Billerica and Royalston, Mass.; Ada, Minn.; Hanover, Lancaster, Newton, and Plymouth, N. H.; Chelsea, Northfield, and Norwich, Vt.; Sparta, Wis. 12th, Eastport and Houlton, Me.; Bar Harbor and Concord, Mass.; Littleton, N. H. 13th, Caldwell, Mich.; New Brunswick, N. J.; Baldwinville, N. Y.; Manitowoc, Wis. 14th, Greenhorn, Colo.; Sault Ste. Marie, Mich.; Clear Lake and Fergus Falls, Minn.; Mayville, N. Dak. 15th, Greenhorn, Colo.; Concord, Mass. 16th, Collegeville, Minn.; Medford, Wis. 17th, Collegeville, Minn. 18th, Cornish, Me.; Turin, N. Y.; Chelsea, Vt. 19th, Cornish, East Machias, and Easton, Me.; Hanover and Plymouth, N. H.; Turin, N. Y.; Chelsea, Vt. 20th, Seymour, Ind.; Mayfield, Me. 22d, Greenhorn, Colo.; Lowell, Ohio. 23d, Mayville, N. Dak. 24th, Toms River, N. J. 25th, Pioche, Nev.; Keokuk Falls, Okla. 26th, Eastport, Houlton, Gardiner, and Lewiston, Me.; Turlington, Nebr.; Chelsea, Vt. 28th, Worthington, Ind.; Boon, Mich.; Willmar, Minn.

## STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for April, 1893, of the directors of the various state weather services:

### ALABAMA.

*Temperature.*—The mean was 3.3 above the normal; maximum, 90, at Newburg, 5th; minimum, 32, at Newburg, 22d and 24th; greatest monthly range, 58, at Newburg; least monthly range, 32, at Daphne.

*Precipitation.*—The average was 1.07 below the normal; greatest monthly, 9.95, at Florence; least monthly, 0.88, at Greensboro.

*Wind.*—Prevailing direction, south.—P. H. Mell, Observer, Weather Bureau, Auburn, director.

### ARIZONA.

*Temperature.*—The mean was 1.5 above the normal; maximum, 102, at Palomas, 21st; minimum, 15, at Whipple Barracks, 30th; greatest monthly range, 67, at Palomas; least monthly range, 41, at Fort Bowie.

*Precipitation.*—The average was 0.50 below the normal; greatest monthly, trace, at Tucson; least monthly, 0.00, at all other stations.

*Wind.*—Prevailing direction, southwest.—W. Burrows, Observer, Weather Bureau, Tucson, director.

### ARKANSAS.

*Temperature.*—The mean was 1.7 above the normal; maximum, 94, at Hot Springs, 4th, and at Fort Smith, 5th; minimum, 29, at Keesees Ferry, 15th; greatest monthly range, 64, at Hot Springs; least monthly range, 43, at Greenville, Miss.

*Precipitation.*—The average was 2.65 above the normal; greatest monthly, 13.22, at Rogers; least monthly, 3.64, at Fulton.

*Wind.*—Prevailing direction, south.—F. H. Clarke, Local Forecast Official, Weather Bureau, Little Rock, director.

### CALIFORNIA.

*Temperature.*—The mean was 2.4 below the normal; maximum, 105, at Volcano Springs, 21st; minimum, 10, at Cisco, 7th; greatest monthly range, 64, at Tulare and Pasadena; least monthly range, 19, at Point Lobos.

*Precipitation.*—The average was 0.80 below the normal; greatest monthly, 12.12, at Crescent City; least monthly, 0.00, at a number of stations in the southern part of the state.

*Wind.*—Prevailing direction, northwest.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

#### COLORADO.

*Temperature.*—The mean was 3.0 below the normal; maximum, 93, at Minneapolis, 6th; minimum, -12, at Pikes Peak, 19th.

*Precipitation.*—The average was about 1.00 below the normal; greatest monthly, 7.60, at Climax; least monthly, 0.00, at Monte Vista and Sanborn.—*J. J. Gilligan, Observer, Weather Bureau, Denver, director.*

#### FLORIDA.

*Temperature.*—The mean was 2.0 above the normal; maximum, 94, at Mullet Key, 19th, at Orange City, 29th, and at Bristol, 28th; minimum, 44, at New Smyrna and De Land, 1st; greatest monthly range, 47, at Bristol; least monthly range, 19, at Hypoluxo.

*Precipitation.*—The average was 0.08 below the normal; greatest monthly, 6.03, at Bristol, all of which fell in 24 hours; least monthly, 0.32, at Merritts Island.

*Wind.*—Prevailing direction, southeast.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

#### GEORGIA.

*Temperature.*—Maximum, 94, at Americus and Darien, 28th; minimum, 30, at Diamond, 24th; greatest monthly range, 56, at Hawkinsville; least monthly range, 46, at Millen.

*Precipitation.*—Greatest monthly, 6.10, at Piscola; least monthly, 0.75, at Hephzibah.

*Wind.*—Prevailing direction, southwest.—*Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.*

#### IDAHO.

*Temperature.*—Maximum, 73, at Payette, 25th; minimum, zero, at Bonanza City, 8th; greatest monthly range, 52, at Lake; least monthly range, 39, at Moscow.

*Precipitation.*—Greatest monthly, 4.21, at Kootenai; least monthly, 0.25, at Hailey.

*Wind.*—Prevailing direction, northwest.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

#### ILLINOIS.

*Temperature.*—The mean was 0.9 below the normal; maximum, 90, at Walnut, 7th; minimum, 21, at Bloomington, 15th.

*Precipitation.*—The average was 4.36 above the normal; greatest monthly, 16.56, at Pana; least monthly, 3.71, at Riley.

*Wind.*—Prevailing directions, southeast and northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

#### INDIANA.

*Temperature.*—The mean was 0.2 below the normal; maximum, 85, at Laconia, 6th; minimum, 25, at Angola, 2d; greatest monthly range, 57, at Valparaiso; least monthly range, 42, at Marion.

*Precipitation.*—The average was 4.64 above the normal; greatest monthly, 16.60, at Marengo; least monthly, 4.16, at Valparaiso.

*Wind.*—Prevailing direction, southwest.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

#### IOWA WEATHER AND CROP SERVICE.

*Temperature.*—The mean was about 4.0 below the normal; maximum, 96, at Glenwood, 6th; minimum, 15, at Eagle Grove and Fort Madison, 9th; greatest monthly range, 74, at Fort Madison; least monthly range, 44, at Sac City.

*Precipitation.*—The average was 1.50 above the normal; greatest monthly, 8.51, at Fairfield; least monthly, 1.24, at Villisca.

*Wind.*—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

#### KANSAS.

*Temperature.*—The mean was 0.2 below the normal; maximum, 103, at Kiowa, 6th; minimum, 10, at Quinter, 21st, and at Grainfield, 29th; greatest monthly range, 85, at Eureka Ranch and Mankato; least monthly range, 57, at La Crosse.

*Precipitation.*—The average was 0.78 below the normal; greatest monthly, 8.51, at Columbus; least monthly, trace, at Bucklin, Coldwater, Grinnell, and Mankato.

*Wind.*—Prevailing direction, northwest.—*T. B. Jennings, Observer, Weather Bureau, Topeka, director.*

#### KENTUCKY.

*Temperature.*—The mean was 1.5 above the normal; maximum, 94, at Pellville, 7th; minimum, 21, at Springfield, 23d; greatest monthly range, 66, at Springfield; least monthly range, 32, at Richmond.

*Precipitation.*—The average was 2.66 above the normal; greatest monthly, 14.30, at Caddo; least monthly, 3.47, at South Fork.

*Wind.*—Prevailing direction, southwest.—*Frank Burke, Local Forecast Official, Weather Bureau, Louisville, director.*

#### LOUISIANA.

*Temperature.*—The mean was about 2.2 above the normal; maximum, 93, at Coushatta, 4th; minimum, 38, at Natchitoches, 15th; greatest monthly range, 54, at Coushatta; least monthly range, 27, at Port Eads.

*Precipitation.*—The average was about 2.56 below the normal; greatest monthly, 8.87, at Homer; least monthly, 1.10, at New Iberia.

*Wind.*—Prevailing direction, north.—*R. E. Kerkam, Local Forecast Official, Weather Bureau, New Orleans, director.*

#### MARYLAND.

*Temperature.*—Maximum, 92, at Boettcherville, 8th; minimum, 22, at Sunnyside, 24th; greatest monthly range, 59, at Sunnyside; least monthly range, 38, at Cambridge and Great Falls.

*Precipitation.*—Greatest monthly, 6.75, at Oakland; least monthly, 2.53, at Jewell.

*Wind.*—Prevailing direction, southeast.—*Dr. William B. Clark, Johns Hopkins University, Baltimore, director; Prof. Milton Whitney, Maryland Agricultural College, secretary and treasurer; C. P. Cronk, Observer, Weather Bureau, in charge.*

#### MICHIGAN.

*Temperature.*—The mean was 2.3 below the normal; maximum, 84, at Berrien Springs (a), 7th; minimum, 8, at Bellaire, 2d; greatest monthly range, 60, at Washington, Bellaire, and Caldwell; least monthly range, 34, at Calumet and Escanaba.

*Precipitation.*—The average was 1.99 above the normal; greatest monthly, 7.72, at Berrien Springs (a); least monthly range, 1.20, at Charlevoix.

*Wind.*—Prevailing direction, southwest.—*E. A. Evans, Local Forecast Official, Weather Bureau, Detroit, director.*

#### MINNESOTA.

*Temperature.*—Maximum, 76, at Camden and Caledonia, 3d; minimum, -3, at Saint Vincent, 14th; greatest monthly range, 63, at Saint Charles; least monthly range, 36, at Ada and Duluth.

*Precipitation.*—Greatest monthly, 6.96, at Camden; least monthly, 1.30, at Rochester.

*Wind.*—Prevailing direction, northwest.—*E. A. Beals, Observer, Weather Bureau, Minneapolis, director.*

#### MISSISSIPPI.

*Temperature.*—Maximum, 94, at Brookhaven, 10th; minimum, 31, at Lake, 28th; greatest monthly range, 58, at Vaiden; least monthly range, 38, at Briers.

*Precipitation.*—The average was 2.38 below the normal; greatest monthly, 8.36, at University; least monthly, 1.14, at Meridian.

*Wind.*—Prevailing direction, south.—*R. J. Hyatt, Local Forecast Official, Weather Bureau, Vicksburg, director.*

#### NEBRASKA.

*Temperature.*—Maximum, 100, at Indianola, 1st; minimum, 1, at Fort Sidney, 14th; greatest monthly range, 85, at Lexington; least monthly range, 47, at Kennedy.

*Precipitation.*—Greatest monthly, 4.10, at Stanton; least monthly, 0.00, at Imperial.

*Wind.*—Prevailing direction, northwest.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Observer, Weather Bureau, assistant.*

#### NEVADA.

*Temperature.*—The mean was 6.8 below the normal; maximum, 79, at Belleville, 23d; minimum, zero, at Stofiel, 9th; greatest monthly range, 62, at Sunnyside; least monthly range, 34, at Golconda.

*Precipitation.*—The average was 0.30 above the normal; greatest monthly, 3.20, at Stofiel; least monthly, trace, at Candelaria.—*Prof. Charles W. Friend, Carson City, director; F. A. Carpenter, Observer, Weather Bureau, assistant.*

#### NEW ENGLAND.

*Temperature.*—The mean was 2.2 below the normal; maximum, 78, at Somerset and Mansfield, 14th; minimum, -7, at Fort Kent, 7th; greatest monthly range, 70, at Fort Kent; least monthly range, 25, at Nantucket.

*Precipitation.*—The average was 0.07 above the normal; greatest monthly, 7.68, at South Dennis; least monthly, 1.20, at Fort Kent.

*Wind.*—Prevailing direction, northwest.—*J. Warren Smith, Observer, Weather Bureau, Boston, director.*

#### NEW JERSEY.

*Temperature.*—The mean was 1.3 above the normal; maximum, 82, at Beverly, 4th; minimum, 19, at Newton, 2d; greatest monthly range, 57, at Tenafly; least monthly range, 31, at Atlantic City and Ocean City.

*Precipitation.*—The average was 1.74 above the normal; greatest monthly, 7.12, at Toms River; least monthly, 2.97, at Junction.

*Wind.*—Prevailing direction, southeast.—*E. W. McGann, Observer, Weather Bureau, New Brunswick, director.*

#### NEW MEXICO.

*Temperature.*—Maximum, 92, at Roswell, 29th; minimum, 7, at Folsom, 14th; greatest monthly range, 72, at Folsom; least monthly range, 51, at Santa Fe.

*Precipitation.*—Greatest monthly, 0.50, at Folsom; least monthly, 0.00, at a number of stations.—*H. B. Hersey, Observer, Weather Bureau, Santa Fe, director.*

#### NEW YORK.

*Temperature.*—The mean was 1.2 below the normal; maximum, 79, at Geneva, 13th; minimum, 11, at Malone, 2d; greatest monthly range, 61, at Ogdensburg; least monthly range, 35, at Setauket.



**Precipitation.**—The average was 1.17 above the normal; greatest monthly, 6.92, at Eden Center; least monthly, 1.67, at Lyons.

**Wind.**—Prevailing direction, northwest.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, director; R. M. Hardinge, Observer, Weather Bureau, assistant.*

#### NORTH CAROLINA.

**Temperature.**—The mean was 1.9 above the normal; maximum, 95, at Rockingham, 9th; minimum, 21, at Bakersville, 24th; greatest monthly range, 69, at Bakersville; least monthly range, 34, at Southport.

**Precipitation.**—The average was 1.06 below the normal; greatest monthly, 7.08, at Highlands; least monthly, 0.88, at Littleton.

**Wind.**—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Observer, Weather Bureau, assistant.*

#### NORTH DAKOTA.

**Temperature.**—The mean was 5.7 below the normal; maximum, 77, at Medora, 23d; minimum, —8, at Milton, 14th; greatest monthly range, 78, at Milton; least monthly range, 41, at University.

**Precipitation.**—The average was 0.05 above the normal; greatest monthly, 3.98, at Wahpeton; least monthly, 0.10, at Bottineau.

**Wind.**—Prevailing direction, northwest.—*W. H. Fallon, Observer, Weather Bureau, Bismarck, director.*

#### OHIO WEATHER AND CROP SERVICE.

**Temperature.**—The mean was 0.6 above the normal; maximum, 93, at Portsmouth, 7th; minimum, 20, at Auburn, 16th; greatest monthly range, 67, at McLuney; least monthly range, 47, at Harbor and Campbellstown.

**Precipitation.**—The average was 3.29 above the normal; greatest monthly, 9.49, at Georgetown; least monthly, 3.08, at Cleveland.

**Wind.**—Prevailing direction, southwest.—*L. N. Bonham, Columbus, director; C. M. Strong, Observer, Weather Bureau, assistant.*

#### OKLAHOMA.

**Temperature.**—Maximum, 102, at Purcell, 5th, and at Mangum, 6th; minimum, 24, at Guthrie, 24th; greatest monthly range, 74, at Gate City; least monthly range, 58, at Lehigh.

**Precipitation.**—Greatest monthly, 6.48, at Eufaula; least monthly, 0.01, at Gate City.

**Wind.**—Prevailing direction, south.—*J. I. Widmeyer, Observer, Weather Bureau, Oklahoma City, director.*

#### PENNSYLVANIA.

**Temperature.**—The mean was 0.5 below the normal; maximum, 85, at Johnstown, 8th; minimum, 16, at Columbus, 16th; greatest monthly range, 58, at Hollidaysburg; least monthly range, 38, at Harrisburg.

**Precipitation.**—The average was 1.47 above the normal; greatest monthly, 6.91, at Clarion; least monthly, 2.95, at Reading.

**Wind.**—Prevailing direction, west.—*Under direction of the Franklin Institute, Philadelphia; W. P. Tatham, director; H. L. Ball, Observer, Weather Bureau, assistant.*

#### SOUTH DAKOTA.

**Temperature.**—The mean was 4.5 below the normal; maximum, 82, at Oelrichs, 6th; minimum, 4, at Bowdle, 14th; greatest monthly range, 78, at Frankfort; least monthly range, 46, at Bear Valley.

**Precipitation.**—The average was 0.92 above the normal; greatest monthly, 6.85, at Flandreau; least monthly, 0.35, at Piedmont.

**Wind.**—Prevailing direction, northwest.—*S. W. Glenn, Local Forecast Official, Weather Bureau, Huron, director.*

#### TENNESSEE WEATHER AND CROP SERVICE.

**Temperature.**—The mean was 2.0 above the normal; maximum, 92, at Harriman, 9th; minimum, 28, at Newport and Springdale, 24th; greatest monthly range, 62, at Harriman and Springdale; least monthly range, 46, at Bolivar (b), Rogersville, Florence Station, and Fayetteville.

**Precipitation.**—The average was 0.87 above the normal; greatest monthly, 8.73, at Fayetteville; least monthly, 2.71, at Johnson City.

**Wind.**—Prevailing direction, south.—*J. B. Marbury, Local Forecast Official, Weather Bureau, Nashville, director.*

#### TEXAS.

**Temperature.**—The mean was 4.5 above the normal; maximum, 108, at Twohig, 2d; minimum, 19, at Coldwater, 19th; greatest monthly range, 74, at Coldwater; least monthly range, 27, at Galveston.

**Precipitation.**—The average was 1.14 below the normal; greatest monthly, 6.47, at Sugar Land; least monthly, 0.00, at several stations.

**Wind.**—Prevailing direction, south.—*D. D. Bryan, Galveston, director; I. M. Cline, Local Forecast Official, Weather Bureau, assistant.*

#### UTAH.

**Temperature.**—The mean was 5.0 below the normal; maximum, 88, at Saint George, 22d; minimum, 1, at Scofield, 8th; greatest monthly range, 66, at Scofield; least monthly range, 42, at Lake Park.

**Precipitation.**—Greatest monthly, 3.09, at Provo; least monthly, 0.00, at Losee.

**Wind.**—Prevailing direction, northwest.—*G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.*

#### VIRGINIA.

**Temperature.**—Maximum, 92, at Dale Enterprise, 8th; minimum, 20, at Avon, 6th; greatest monthly range, 67, at Avon and Dale Enterprise; least monthly range, 40, at Alexandria.

**Precipitation.**—Greatest monthly, 4.83, at Big Stone Gap; least monthly, 0.84, at Hampton.

**Wind.**—Prevailing direction, south.—*Dr. E. A. Craighill, Lynchburg, director; J. N. Ryker, Observer, Weather Bureau, assistant.*

#### WASHINGTON.

**Temperature.**—The mean was 4.7 below the normal; maximum, 74, at Ellensburg, 26th; minimum, 20, at Waterville, 11th; greatest monthly range, 51, at Ellensburg; least monthly range, 16, at Olga and Vashon.

**Precipitation.**—The average was 3.04 above the normal; greatest monthly, 13.82, at Neah Bay; least monthly, 1.30, at Fort Simcoe.

**Wind.**—Prevailing direction, southwest.—*H. F. Alciatore, Observer, Weather Bureau, Olympia, director.*

#### WEST VIRGINIA.

**Temperature.**—Maximum, 92, at Point Pleasant, 7th; minimum, 20, at Davis, 24th; greatest monthly range, 66, at Marlinton; least monthly range, 48, at Spencer.

**Precipitation.**—Greatest monthly, 8.98, at Pleasant Hill; least monthly, 2.91, at Marlinton.

**Wind.**—Prevailing direction, southwest.—*W. W. Dent, Observer, Weather Bureau, Parkersburg, director.*

#### WISCONSIN.

**Temperature.**—The mean was about 4.0 below the normal; maximum, 86, at Sharon, 7th; minimum, zero, at Butternut, 23d; greatest monthly range, 65, at Janesville; least monthly range, 37, at Bayfield.

**Precipitation.**—The average was 2.00 below the normal; greatest monthly, 6.67, at Raymond; least monthly, 1.76, at Bayfield.

**Wind.**—Prevailing direction, northeast.—*W. L. Moore, Local Forecast Official, Weather Bureau, Milwaukee, director.*

#### WYOMING.

**Temperature.**—Maximum, 76, at Wheatland, 3d, and at Lusk, 6th; minimum, 1, at Arland, 20th; greatest monthly range, 70, at Wheatland; least monthly range, 44, at Fort Yellowstone.

**Precipitation.**—Greatest monthly, 3.16, at Lander; least monthly, 0.32, at Laramie.

**Wind.**—Prevailing direction, west.—*E. M. Ravenscraft, Observer, Weather Bureau, Cheyenne, director.*

### METEOROLOGICAL TABLES.

Meteorological record of voluntary and other co-operating observers, April, 1893.

Stations.	Temperature. (Fahrenheit.)			Precip'n.		Stations.	Temperature. (Fahrenheit.)			Precip'n.	
	Max.	Min.	Mean.				Max.	Min.	Mean.		
<i>Alabama.</i>	°	°	°	Ins.		<i>Alabama—Cont'd.</i>	°	°	°	Ins.	
Alco.....	88	41	69.6	.....		Daphne.....	81	49	66.6	3.44	
Bermuda *†.....	85	42	68.3	1.19		Decatur *†.....	.....	.....	.....	5.41	
Birmingham.....	.....	.....	.....	2.55		Demopolis.....	.....	.....	.....	1.20	
Brewton.....	88	39	66.8	3.50		Elba *†.....	87	48	68.3	2.48	
Camden *†.....	86	46	67.8	2.50		Eufaula.....	88*	43*	68.4*	.....	
Carrollton.....	.....	.....	.....	07.1	2.20	Eufaula.....	.....	.....	.....	1.37	
Citronelle.....	84	48	70.9	3.78		Florence *†.....	.....	.....	.....	7.23	
Claiborne Landing.....	.....	.....	.....	4.57		Florence *†.....	88	34	64.8	9.95	
Clanton.....	85	51	68.6	2.21		Gadsden.....	.....	.....	.....	5.64	
Cordova.....	.....	.....	.....	4.21		Greensboro *†.....	88	41	68.6	0.88	

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.		Stations.	Temperature. (Fahrenheit.)			Precip'n.	
	Max.	Min.	Mean.				Max.	Min.	Mean.		
<i>Alabama—Cont'd.</i>	°	°	°	Ins.		<i>Alabama—Cont'd.</i>	°	°	°	Ins.	
Healing Springs.....	82	39	59.4	3.35		Newberg.....	90	32	65.0	5.79	
Highland Home.....	85	44	68.4	3.64		Newton.....	89	42	68.2	3.67	
Livingston *†.....	88	40	66.8	0.91		Oxanna *†.....	83	46	66.5	4.18	
Livingston *†.....	.....	.....	.....	0.73		Scottsboro.....	84	36	62.7	7.85	
Lynn.....	.....	.....	.....	8.06		Selma.....	.....	.....	.....	3.17	
Lynn *†.....	86	34	62.8	7.63		Sturdevant.....	.....	.....	.....	4.73	
Maple Grove.....	84*	35	63.9	6.10		Talladega.....	.....	.....	.....	4.19	
Marion.....	.....	.....	.....	1.52		Talladega Falls.....	.....	.....	.....	4.46	
Maysville.....	84	40	63.5	9.22		Tuscaloosa.....	.....	.....	.....	2.61	
Mount Willing.....	87	43	70.2	2.83		Tuscumbia *†.....	86	39	63.1	8.36	
Newbern.....	86	40	67.3	1.04		Tuscumbia *†.....	.....	.....	.....	9.13	

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Alabama—Cont'd.	°	°	°	Ins.	California—Cont'd.	°	°	°	Ins.
Union t.....	88	46	68.7	2.50	Arlington Heights.....	88	36	58.4	0.35
Union Springs a t.....	88	40	67.4	2.63	Athlone.....	77	36	57.6	0.53
Uniontown.....	87	44	68.3	2.40	Auburn.....	78	39	55.6	3.71
Valley Head t.....	82	35	61.6	5.51	Bakersfield.....	83	46	62.7	0.32
Warrior t.....	82	35	61.6	5.51	Bakersfield b t.....	83	28	56.2	0.10
Wilsonville t.....	82	35	61.6	4.17	Ballast Point L. H.....	87	40	60.6	0.10
Alaska.....					Barstow t.....	87	40	60.6	0.06
Killisnoo t.....	46	26	36.4	3.30	Beaumont.....	76	41	57.8	0.40
Metlakatla t.....	65	24	41.6	3.41	Belmont.....	72	45	54.9	0.40
Arizona.....					Berendo.....	85	45	61.4	0.42
Antelope Valley.....	82	36	62.0	0.00	Berkeley.....	68	40	52.1	1.62
Aria. Can. Co. Dam.....	93	46	65.4	0.00	Biggs.....	80	40	57.3	0.69
Benson.....	84	39	60.8	0.00	Bishop Creek.....	79	38	59.3	0.00
Bieber t.....	84	39	60.8	0.00	Boca.....	60	0	34.5	1.90
Buckeye t.....	84	39	60.8	0.00	Borden.....	80	43	58.3	0.40
Calabasas t.....	84	39	60.8	0.00	Boulder Creek.....	80	36	50.6	3.49
Casa Grande.....	93	55	73.4	0.00	Brentwood.....	78	42	52.4	0.95
Chiricahua Mts t.....	84	36	62.0	0.00	Brighton.....	83	41	60.2	1.00
Crittenden t.....	84	36	62.0	0.00	Caliente.....	80	42	57.1	0.70
Dragoon t.....	84	36	62.0	0.00	Calistoga.....	80	40	54.7	3.21
Dragoon Summit.....	82	36	62.0	0.00	Campo Seco.....	80	40	54.7	1.54
Dudleyville t.....	92	36	64.3	0.00	C. Mendocino L. H.....	76	42	52.6	3.50
Eagle Pass.....	92	36	64.3	0.00	Capitola.....	76	42	52.6	0.00
Florence t.....	92	36	64.3	0.00	Castroville.....	75	43	56.6	1.55
Fort Apache.....	77	37	57.4	0.00	Centerville.....	80	43	56.8	1.67
Fort Bowie.....	83	42	61.9	0.00	Chico.....	80	36	53.4	1.03
Fort Grant.....	83	39	61.4	0.00	Chino.....	87	45	61.3	0.33
Fort Huachuca.....	85	37	61.6	0.00	Cisco.....	40	10	29.8	0.00
Fort Mohave.....	98	43	69.7	0.00	Citrus.....	80	40	55.7	0.00
Gila Bend a t.....	92	42	70.7	0.00	Claremont t.....	80	34	55.2	0.54
Gila Bend b t.....	98	52	76.2	0.00	Cloverdale.....	79	38	57.3	3.94
Holbrook t.....	79	19	50.8	0.00	Colegrove.....	80	40	54.7	0.25
Maricopa.....	90	43	74.5	0.00	Colfax.....	75	32	47.8	4.22
Mount Huachuca t.....	86	36	62.1	0.00	Colton.....	85	42	59.2	0.16
Natural Bridge.....	81	39	59.8	0.00	Colusa.....	80	36	54.8	0.71
Oro.....	81	39	59.8	0.00	Corning.....	83	38	54.9	1.80
Palomas t.....	102	35	66.0	0.00	Corning City.....	83	38	54.9	1.80
Pantano.....	90	46	66.8	0.00	Crescent City.....	88	43	64.9	13.78
Payson.....	90	42	65.7	0.00	Crofton.....	88	43	64.9	0.67
Peoria t.....	90	42	65.7	0.00	Davisville.....	79	47	60.0	0.85
Phoenix t.....	92	40	67.3	0.00	Davisville.....	84	43	61.8	0.84
Red Rock t.....	97	43	72.8	0.00	Delano.....	83	40	57.0	0.24
St. Helena R. h. t.....	83	40	60.2	0.00	Delta.....	75	42	57.3	8.90
San Carlos.....	90	35	60.7	0.00	Downey.....	86	46	61.9	0.22
San Simon.....	95	50	68.7	0.00	Drytown.....	81	31	53.0	2.11
Show Low.....	92	40	63.9	0.00	Duarte.....	86	40	59.8	0.74
Signal t.....	92	40	63.9	0.00	Dunnigan.....	78	46	58.4	0.94
Tevison.....	92	40	63.9	0.00	Dunsmuir.....	72	28	47.6	8.75
Texas Hill.....	99	49	70.4	0.00	East Brother L. H.....	80	40	54.7	0.62
Tucson a t.....	92	41	66.8	0.00	Edgewood.....	65	28	43.5	3.48
Tucson b t.....	89	36	58.9	0.00	Edmonton.....	62	22	36.8	8.43
Walnut Grove t.....	81	36	57.4	0.00	Eldorado.....	81	37	54.1	3.13
Walnut Ranch t.....	81	36	57.4	0.00	Elmira.....	83	45	59.8	0.90
Whipple Barracks.....	78	15	45.4	0.00	El Verano.....	77	45	56.2	1.76
Willcox.....	86	46	63.2	0.00	Emigrant Gap.....	53	19	41.3	5.71
Yuma.....	95	53	72.9	0.00	Esparto.....	86	40	56.3	0.50
Arkansas.....					Evergreen.....	80	40	56.3	1.46
Arkadelphia t.....	87	38	66.9	7.42	Exeter.....	82	41	60.8	0.33
Ashdown t.....	87	38	66.9	7.42	Fall Brook.....	85	41	55.9	0.49
Bee Branch t.....	86	38	62.6	7.48	Farmington.....	84	40	55.8	0.92
Brinkley t.....	86	38	62.6	7.48	Felton.....	84	36	54.5	1.99
Camden a t.....	86	38	62.6	7.48	Fernando.....	88	40	62.7	0.56
Camden b t.....	86	38	62.6	7.48	Florence.....	80	45	59.2	0.20
Conway.....	87	40	64.7	7.45	Florin.....	85	38	56.9	1.19
Corning.....	90	31	62.6	10.21	Folsom City.....	85	45	59.0	2.04
Dallas.....	91	36	65.4	5.48	Folsom City b.....	85	45	59.2	2.00
Dardanelle t.....	90	30	61.8	11.73	French Corral.....	63	20	40.0	1.88
Fayetteville t.....	90	30	61.8	11.73	French Corral.....	63	20	40.0	1.88
Forrest t.....	90	30	61.8	11.73	Fresno.....	78	42	58.2	0.27
Gaines Landing t.....	90	30	61.8	11.73	Fruto.....	78	44	57.0	1.00
Helena a t.....	92	35	66.7	9.18	Galt.....	80	45	58.8	2.18
Helena b t.....	92	35	66.7	9.18	Georgetown t.....	72	29	48.4	6.34
Hope t.....	86	45	67.2	6.09	Gilroy.....	82	46	57.6	1.35
Hot Springs.....	94	30	65.3	7.61	Girard.....	68	30	46.6	0.35
Jonesboro.....	88	36	64.0	8.21	Glendora.....	78	40	55.2	2.30
Keesees Ferry t.....	89	29	61.0	8.33	Goshen.....	82	38	56.4	0.35
Kirby t.....	87	37	65.5	7.93	Grass Valley a.....	68	26	45.8	5.30
Lono.....	89	39	68.6	7.00	Grass Valley b.....	68	26	45.8	5.30
Madding.....	89	39	68.6	7.00	Gridley.....	82	36	53.2	1.06
Melbourne t.....	92	30	63.2	7.92	Guinda.....	64	43	52.0	1.15
Mount Nebo t.....	86	36	60.7	7.65	Haywards.....	64	43	52.0	1.15
New Gascony.....	86	39	67.8	7.55	Healdsburg.....	74	38	52.2	3.24
Newport t.....	90	34	67.0	9.32	Hollister.....	80	37	51.7	0.98
Oceola t.....	86	39	63.7	7.59	Hornbrook.....	70	32	46.2	1.50
Pine Bluff.....	90	32	66.4	7.59	Humboldt L. H.....	88	35	55.5	0.00
Rogers t.....	91	33	64.3	7.42	Huron.....	88	35	55.5	0.00
Russellville t.....	91	33	64.3	7.42	Hyde Ranch.....	66	31	48.4	5.61
Searcy t.....	88	35	64.3	7.04	Independence t.....	79	25	53.4	0.02
Stuttgart t.....	88	36	67.0	7.38	Indio.....	100	50	68.9	0.00
Texarkana t.....	90	41	66.8	4.33	Ione.....	76	40	56.6	0.23
Washington b t.....	86	44	67.2	6.17	Iowa Hill.....	75	32	49.3	6.69
Winslow t.....	83	35	61.0	10.54	Irrington t.....	78	35	54.8	1.82
California.....					Jolon.....	72	30	50.2	1.35
Agnew.....	75	37	54.2	0.67	Julian.....	72	30	50.2	0.66
Alcalde.....	87	39	59.2	0.62	Keeler.....	74	34	56.2	0.00
Alameda.....	83	40	61.9	0.23	Keene.....	75	37	50.6	1.30
Anderson.....	77	36	53.0	3.65	Kennedy Gold Mine.....	78	28	49.8	3.10
Antioch.....	79	48	56.9	1.02	King City.....	74	36	53.8	0.83
Aptos.....	70	38	51.6	1.54	Kingsburg.....	82	40	61.0	0.20
Arcata.....	70	38	51.6	7.21	Knights Landing.....	90	45	57.5	0.75
					Kono Tayee.....	74	37	52.4	2.06

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
California—Cont'd.	°	°	°	Ins.	California—Cont'd.	°	°	°	Ins.
Lagrange.....	83	35	55.9	0.75	San Jose a.....	74	44	54.4	1.35
Lathrop.....	79	46	59.2	0.89	San Jose b.....	75	39	51.1	1.50
Laurel.....	80	38	52.3	2.48	San Luis L. H.....	75	39	51.1	0.75
Lemoore.....	80	44	58.8	0.05	San Luis Obispo.....	71	46	56.0	1.14
Lick Observatory t.....	65	25	40.5	3.61	San Mateo.....	71	46	56.0	1.02
Lime Point L. H.....	80	44	58.8	0.05	San Miguel.....	81	41	54.4	0.79
Lodi.....	77	39	54.8	1.40	Santa Ana.....	86	54	63.9	0.30
Livermore.....	88	46	61.2	0.10	Santa Barbara a.....	80	40	57.0	0.38
Livingston.....	79	39	55.8	2.04	Santa Barbara L. H.....	80	40	57.0	0.38
Long Beach.....	82	32	57.9	0.00	Santa Clara.....	72	38	52.8	1.46
Los Banos.....	78	46	59.6	0.19	Santa Cruz a.....	75	41	57.7	1.75
Los Gatos a.....	78	43	59.6	2.34	Santa Cruz b t.....	75	40	54.6	1.65
Los Gatos b.....	72	38	51.0	2.57	Santa Cruz L. H.....	75	40	54.6	1.65
Mare Island L. H.....	73	36	51.5	1.16	Santa Margarita.....	80	35	54.0	1.68
Mariposa.....	73	36	51.5	1.90	Santa Maria.....	80	34	53.6	0.80
Martinez.....	72	42	53.8	1.30	Santa Monica.....	77	48	60.9	0.00
Marysville a.....	87	40	58.8	1.00	Santa Paula.....	84	40	60.2	0.40
Marysville b t.....	.....	.....	.....	0.89	Santa Rosa.....	75	38	53.7	2.07
Menlo Park.....	74	39	52.8	1.26	Saticoy t.....	82	40	58.5	0.23
Merced.....	80	42	58.8	0.37	Selma.....	82	40	58.5	0.23
Middletown t.....	84	38	53.0	3.88	Shasta t.....	67	24	44.3	10.10
Mills College.....	80	39	55.9	1.46	Shelter Cove.....	64	40	48.6	7.48
Milton (near).....	80	39	55.9	1.32	Shingle Springs.....	78	40	56.5	2.95
Modesto.....	86	51	62.4	0.45	Sims.....	72	36	46.7	9.69
Mohave.....	80	38	54.7	0.13	Soledad.....	78	36	54.1	0.81
Mokelumne Hill.....	82	43	59.4	0.28	Sonoma.....	77	38	50.9	1.89
Monson.....	82	43	59.4	0.28	S. E. Farrallon L. H.....	73	44	55.4	1.13
Montague.....	70	35	46.3	1.75	South Vallejo.....	73	44	55.4	1.13
Monterey.....	70	35	46.3	1.41	Spadra.....	80	40	59.4	0.00
Monterey (Hotel del Monte).....	70	38	55.4	.....	Stockton a.....	77	40	55.6	0.95
Mount Glenwood.....	78	44	57.6	1.37	Stockton b.....	75	47	59.5	1.05
Napa City a.....	84	40	56.0	0.91	Summit.....	42	14	36.4	9.20
Napa City b.....	75	39	54.4	1.05	Suisun City.....	79	45	57.4	0.72
Napa City t.....	85	35	58.0	0.27	Susanville.....	66	27	42.0	1.83
National City t.....	75	35	54.0	0.27	Sutter Creek.....	72	26	46.6	2.17
Needles a t.....	97	48	69.6	0.00	Tehachapi a.....	67	29	44.9	0.65
Needles b t.....	93	.....	67.8	.....	Tehachapi b.....	70	25	44.9	0.51
Nevada City.....	70	28	46.8	6.22	Tehama.....	80	46	58.0	3.76
New Almaden.....	73	42	54.4	1.78	Templeton.....	88	40	55.8	1.19
Newark.....	76	44	53.8	1.43	Towles.....	71	30	46.0	7.98
Newcastle a t.....	76	34	52.4	3.11	Tracy.....	78	43	59.3	0.55
Newhall.....	93	42	57.8	0.47	Traver.....	83	40	59.1	0.40
Newman.....	75	42	56.8	1.07	Trinidad L. H.....	.....	.....	.....	7.30
Niles.....	80	40	53.8	2.10	Truckee.....	52	16	34.9	3.73
Nordhoff t.....	83	32	54.4	0.45	Tulare a.....	79	37	48.7	0.43
Norwalk.....	82	50	64.0	0.00	Tulare b.....	.....	.....	.....	0.08
Oakdale.....	82	34	52.0	0.78	Tulare c.....	96	32	59.2	0.33
Oakland b.....	68	48	55.6	1.28	Turlock a.....	80	50	64.0	0.32
Ogilby.....	102	60	81.1	0.00	Turlock b.....	82	34	51.0	0.25
Oleta.....	71	36	49.1	2.65	Ukiah.....	72	32	49.4	4.12
Ontario.....	85	45	63.5	0.36	Upper Lake.....	73	33	50.1	2.37
Orangevale t.....	80	37	56.2	4.08	Upper Mattole.....	72	36	50.6	10.06
Orland.....	85	45	58.5	1.79	Vacaville.....	80	45	56.4	0.80
Oroville a.....	80	44	55.9	1.21	Vacaville b.....	80	44	56.2	0.20
Oroville b.....	86	42	62.8	1.46	Valley Springs.....	82	40	58.7	1.87
Pajaro.....	72	41	53.4	1.22	Ventura.....	83	38	58.5	0.42
Palermo.....	81	32	54.4	1.00	Vina.....	81	43	57.1	2.21
Palm Springs.....	100	50	73.0	0.00	Volcano Springs.....	105	59	79.6	0.00
Pasadena.....	88	34	56.3	0.66	Walnut Creek.....	82	38	55.1	1.85
Paso Robles.....	81	40	56.0	1.00	West Butte.....	80	36	50.0	0.59
Petaluma.....	75	45	54.9	1.24	Westley.....	80	46	60.5	0.74
Piedras Blancas L.H.	.....	.....	.....	1.15	Wheatland.....	82	37	55.4	1.14
Pigeon Point L. H.....	.....	.....	.....	1.53	Whittier.....	89	49	61.7	0.23
Placerville a.....	76	36	51.6	4.83	Williams a.....	80	40	58.0	0.60
Placerville b.....	75	24	46.9	5.31	Williams b.....	80	38	56.0	0.68
Pleasanton a.....	85	45	57.8	1.66	Willows a t.....	73	35	54.4	0.97
Pleasanton b.....	77	32	51.8	1.67	Willows b.....	78	40	58.0	0.95
Pt. Ano Nuevo L. H.....	77	32	51.8	2.50	Winchester t.....	89	33	58.1	0.27
Point Arena L. H.....	.....	.....	.....	4.06	Winters.....	82	40	61.1	0.93
Point Bonita L. H.....	.....	.....	.....	1.81	Woodland.....	80	38	55.6	0.62
Point Fermin L. H.....	.....	.....	.....	0.22	Yerba Buena L. H.....	.....	.....	.....	1.20
Point Hueme L.H.	.....	.....	.....	0.35	Yreka.....	71	24	43.8	2.10
Point Loma L. H.....	.....	.....	.....	0.18	Yuba City.....	78	48	59.8	1.01
Point Montara L. H.....	.....	.....	.....	1.57	Colorado.....	.....	.....	.....	0.33
Point Pinos L. H.....	.....	.....	.....	1.52	Abbott.....	.....	.....	.....	0.45
Point Reyes L. H.....	.....	.....	.....	1.83	Agate.....	78	.....	40.5	0.86
Point Sur L. H.....	.....	.....	.....	1.25	Alma t.....	53	—	27.3	.....
Pomona.....	88	42	54.8	0.20	Anherst.....	.....	.....	.....	.....
Porterville a.....	88	46	61.5	0.27	Arborea.....	80	50	.....	0.01
Poway.....	60	42	53.0	0.51	Avoca.....	.....	.....	.....	0.24
Puente.....	85	43	60.0	0.20	Bennet.....	88	28	51.4	0.32
Ravenna.....	84	33	55.3	0.32	Box Elder.....	.....	.....	.....	1.50
Red Bluff.....	80	40	58.8	1.00	Breckenridge t.....	64	—	26.1	6.36
Redding a.....	78	31	54.5	3.94	Brush t.....	85	18	46.0	0.21
Redding b.....	75	34	53.0	4.19	Byers.....	74	24	46.5	0.20
Redlands b.....	86	45	58.7	0.05	Canyon.....	78	16	47.3	0.15
Represa.....	73	43	54.2	2.00	Castle Rock t.....	76	5	42.6	0.90
Rialto.....	91	35	60.6	0.64	Cheyenne Wells.....	87	23	46.3	.....
Rio Vista.....	78	36	49.7	0.99	Chivington.....	.....	.....	.....	0.04
Riverside a t.....	90	34	60.7	0.26	Climax t.....	40	—	19.9	7.60
Rocklin.....	79	45	59.5	2.49	Collbran.....	.....	.....	.....	0.35
Roe Island L. H.....	.....	.....	.....	0.77	Como (near).....	56	1	28.7	0.86
Rumsey.....	79	41	58.9	0.76	Cope t.....	82	19	48.8	0.96
Sacramento a.....	80	33	51.8	1.18	Cumbres.....	47	—	27.6	0.80
Sacramento b.....	76	45	57.7	0.92	Deer Trail.....	78	35	42.8	2.00
Sacramento c.....	82	48	59.0	0.92	Delta.....	82	18	49.4	0.35
Salinas a.....	73	30	51.6	1.26	Downing.....	92	4	50.6	0.37
Salinas b.....	62	42	50.0	1.25	Dumont.....	64	12	35.2	1.10
Salton.....	99	59	77.5	0.00	East Dale.....	.....	.....	.....	0.10
San Ardo.....	76	37	54.6	0.62	First View.....	82	.....	49.2	0.20
San Ardo b.....	80	29	52.0	0.76	Fort Collins.....	79	8	42.7	1.66
San Bernardino.....	86	35	58.8	0.48	Fort Collins (near).....	.....	.....	.....	0.75
San Gabriel.....	85	44	60.6	0.20	Fruita.....	80	21	50.8	0.01
Sanger Junction.....	87	45	61.2	0.05	Garnett.....	.....	.....	.....	1.38
San Jacinto.....	90	30	57.4	0.25	Gaynor.....	78	22	41.3	.....



## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<b>Colorado—Cont'd.</b>					<b>Florida—Cont'd.</b>				
Glen Eyrie f.....	72	14	42.6	0.72	Manatee f.....	91	46	71.4	1.70
Gold Hill.....	66	0	36.0	1.90	Merritts Island f.....	86	56	74.5	0.32
Grand Junction f.....	76	24	51.4	0.30	Moseley Hall f.....	89	50	71.0	5.44
Greenlee f.....	77	19	44.2	0.57	Mullet Key f.....	94	60	72.6	1.13
Greenhorn f.....	79	9	44.0	1.27	Myers f.....	89	51	73.5	3.32
Grover f.....	77	12	42.4	0.90	New Smyrna f.....	85	44	69.4	0.33
Hugo f.....	74	26	43.0	0.21	Ocala f.....	88	50	71.8	1.24
Hugo (near) f.....	79	9	42.2	0.24	Orange City f.....	94	50	75.1	0.58
Husted f.....	75	1	43.6	0.96	Oxford f.....	88	52	72.6	0.89
Idaho Springs f.....	74	9	36.1	0.67	Plant City f.....	93	48	73.8	2.37
Julesburg.....	83	5	45.8	0.04	St. Andrews Bay f.....	90	48	71.4	2.71
Kirk.....	86	25	47.4	1.10	Saint Francis B'ks.	84	49	69.4	3.50
Kit Carson f.....	86	25	47.4	1.12	St. Petersburg f.....	91	52	73.6	0.51
La Jara f.....	71	11	43.1	0.18	Tallahassee f.....	85	46	69.3	5.70
La Porte.....	81	11	43.1	1.54	Tarpon Springs f.....	92	50	73.0	0.65
Las Animas f.....	86	15	52.2	0.01	<b>Georgia.</b>				
Lavender f.....	72	0	41.8	1.00	Adairsville f.....	88	32	64.6	2.57
Le Roy f.....	81	21	44.7	0.40	Alapaha f.....	89	42	68.7	4.49
Leslie.....	79	10	43.4	0.88	Albany f.....	90	46	69.4	4.54
Livermore.....	72	15	40.6	1.50	Americus f.....	94	38	70.2	2.07
Longmont f.....	79	10	43.4	0.88	Athens f.....	86	41	66.2	2.20
Loveland.....	81	11	43.1	1.41	Athens b f.....	86	35	65.2	2.56
McCoy f.....	81	11	43.1	1.41	Bainbridge f.....	86	35	65.2	2.56
Middle Box Elder.....	81	11	43.1	1.41	Blakely f.....	89	47	70.9	2.95
Minneapolis f.....	93	15	52.5	0.21	Brag f.....	92	41	69.9	2.14
Monte Vista f.....	69	8	39.5	0.00	Camak f.....	88	44	69.4	2.84
Monte Vista b.....	67	11	39.6	0.00	Canton f.....	88	44	69.4	2.84
Moraine f.....	59	4	34.0	1.34	Columbus f.....	88	44	69.4	2.84
Orchard.....	85	29	53.4	0.10	Cordele f.....	93	40	69.6	1.99
Pagoda (near) f.....	66	9	38.6	1.66	Dahlonega f.....	87	38	63.0	2.29
Paonia f.....	81	11	43.1	0.50	Darien f.....	94	47	71.0	3.25
Parachute f.....	76	11	42.1	0.50	Diamond f.....	92	30	59.8	2.76
Red Cliff.....	81	11	43.1	1.03	Dublin f.....	85	41	68.6	1.14
Rico.....	84	26	50.0	0.40	Elberton f.....	89	41	66.4	2.27
River Bend.....	84	26	50.0	0.40	Fleming f.....	90	42	68.5	2.48
Rocky Ford f.....	85	17	50.6	0.25	Forsyth f.....	88	47	69.4	2.40
Saint Cloud.....	81	11	43.1	1.03	Fort Gaines f.....	88	42	68.2	3.30
Sanborn.....	81	11	43.1	1.03	Gainesville f.....	86	36	64.2	1.88
San Luis f.....	70	8	39.4	0.28	Gillsville f.....	86	40	64.9	1.25
Sciassa f.....	81	11	43.1	1.03	Hawkinsville f.....	87	34	66.2	1.40
Seibert f.....	81	11	43.1	1.03	Hephzibah f.....	90	46	69.2	0.75
Sheridan Lake f.....	81	11	43.1	1.03	Homerville f.....	87	48	70.2	4.47
Smoky Hill Mine f.....	72	6	36.3	2.08	Lagrange f.....	85	39	66.7	2.66
Springfield.....	61	8	33.7	1.95	Lincolnton f.....	92	35	66.0	1.62
Stamford f.....	61	8	33.7	1.95	Louisville f.....	92	40	68.5	1.34
Steamboat Spring f.....	62	20	40.4	3.20	Lumpkin f.....	86	46	68.5	1.60
Sunnyside.....	65	4	28.6	1.74	McArthur f.....	90	44	71.8	1.90
Thon f.....	82	11	42.8	0.11	Macon f.....	84	35	63.4	2.34
T. S. Ranch f.....	81	11	43.1	1.03	Marietta f.....	88	43	72.3	2.53
Twin Lakes.....	81	11	43.1	1.03	Marshallville f.....	87	41	65.4	1.79
Waller f.....	81	11	43.1	1.03	Milledgeville f.....	84	38	69.0	0.83
Ward District.....	82	28	49.8	0.55	Millen f.....	87	48	70.2	4.47
Watkins f.....	80	16	42.8	0.03	Morgan f.....	84	35	63.4	2.34
Wiley f.....	80	16	42.8	0.03	Mount Vernon f.....	90	49	70.9	6.10
Wray f.....	80	16	42.8	0.03	Piscola.....	86	40	65.0	1.35
Yuma.....	80	16	42.8	0.03	Point Peter f.....	91	42	68.5	4.70
Zuck.....	80	16	42.8	0.03	Poultan f.....	92	40	70.0	5.20
<b>Connecticut.</b>					Quitman f.....	92	40	70.0	5.20
Canton.....	69	21	43.0	4.22	Reynolds f.....	84	36	62.2	3.33
Colchester.....	70	22	44.0	5.14	Rome f.....	87	41	66.4	2.78
Falls Village.....	67	26	45.0	4.12	Talbotton f.....	89	47	70.2	5.72
Hartford.....	67	26	45.0	4.12	Thomasville f.....	88	36	64.0	3.70
Hartford b.....	67	26	45.0	4.12	Toccoa f.....	89	40	67.0	1.71
Lake Konomoc.....	67	26	45.0	4.12	Union Point f.....	89	40	67.0	1.71
Lebanon.....	67	26	45.0	4.12	Washington f.....	89	40	67.0	1.71
Middletown.....	70	25	45.4	4.33	Waynesboro f.....	89	40	67.0	1.71
New Hartford f.....	65	20	37.6	3.90	Whitesburg f.....	89	40	67.0	1.71
New Hartford b.....	65	20	37.6	3.90	<b>Idaho.</b>				
North Franklin.....	64	19	42.0	3.24	American Falls f.....	71	21	40.0	1.04
N. Grosvenor Dale f.....	64	19	42.0	3.24	Boise Barracks.....	68	26	46.4	1.86
Norwalk f.....	69	25	43.6	3.90	Bonanza City f.....	51	0	30.6	1.20
Southington f.....	67	24	44.4	3.68	Fort Sherman.....	65	25	42.2	4.75
South Manchester.....	67	24	44.4	3.68	Hailey.....	65	25	42.2	4.75
Stevenson.....	68	20	42.0	3.82	Kootenai f.....	89	20	40.9	4.21
Storrs f.....	68	20	42.0	3.82	Lake f.....	54	2	32.3	0.60
Voluntown f.....	69	19	43.8	4.01	Martin f.....	58	12	33.3	1.19
Wallingford f.....	69	19	43.8	4.01	Moscow f.....	64	26	40.7	3.01
Waterbury.....	70	26	46.2	3.49	Payette f.....	73	22	48.6	1.24
West Simsbury.....	70	26	46.2	3.49	<b>Illinois.</b>				
<b>Delaware.</b>					Alton f.....	87	34	66.4	2.78
Dover f.....	77	37	52.9	3.59	Atwood f.....	87	34	66.4	2.78
Kirkwood f.....	72	14	42.6	0.72	Aurora f.....	84	22	46.2	4.65
Millsboro f.....	80	34	53.3	5.31	Aurora b f.....	86	26	46.0	5.81
Seaford f.....	78	35	53.6	4.68	Beardstown f.....	86	26	46.0	5.81
<b>District of Columbia.</b>					Bloomington f.....	72	21	45.7	8.34
Dist'ing Reserv' f.....	75	38	54.0	2.85	Bushnell f.....	76	28	49.4	6.80
Rec'ing Reserv' f.....	76	39	54.0	2.63	Carlisle f.....	87	29	53.0	9.23
West Washington f.....	83	34	56.4	3.02	Carlyle.....	87	29	53.0	9.23
<b>Florida.</b>					Chester f.....	88	23	45.6	4.02
Amelia f.....	85	48	69.0	1.90	Dixon f.....	88	23	45.6	4.02
Avon Park f.....	87	60	75.6	1.82	East Peoria f.....	87	25	50.1	8.51
Bristol f.....	94	47	72.6	6.03	Flora f.....	85	30	55.6	14.01
Chattahoochee.....	85	48	69.0	1.90	Fort Sheridan f.....	81	25	43.8	5.87
Landing f.....	85	48	69.0	1.90	Galva f.....	88	23	45.6	4.02
Clermont f.....	93	60	74.4	0.68	Golconda f.....	81	35	61.0	8.82
De Land f.....	86	45	69.6	0.84	Greenville f.....	84	28	54.4	11.86
Eustis f.....	92	50	72.9	0.84	Griggsville f.....	87	37	51.4	7.69
Federal Point f.....	88	45	70.2	3.91	Havana f.....	87	32	52.1	7.95
Fort Meade f.....	88	45	70.2	3.91	Hennepin f.....	88	26	48.7	5.20
Grasmere.....	90	50	73.4	2.18	Jordans Grove f.....	84	30	57.5	9.73
Green Cove Spgs f.....	89	49	71.4	2.18	Kankakee f.....	81	28	48.1	5.45
Homeland f.....	90	46	70.3	0.98	Lagrange f.....	86	22	46.5	6.51
Hypoluxo f.....	86	67	74.4	3.28	Martinsville f.....	81	26	53.6	9.16
Kissimmee f.....	93	50	74.2	1.70	Mascoutah f.....	86	32	54.3	10.20
Lake City f.....	90	50	73.6	3.65					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<b>Illinois—Cont'd.</b>					<b>Iowa—Cont'd.</b>				
Mount Carmel †	86	42	57.8	7.93	Delaware #1	84	22	41.7	3.71
Muddy Valley #1	86	42	57.8	7.66	Denison	77	21	46.2	3.18
New Haven †	82	36	57.1	7.14	Eagle Grove #1	77	15	40.2	7.01
Olney a #1	82	38	57.1	10.44	Elkader †	81	22	42.6	4.50
Olney b #1	87	30	53.4	13.64	Emmetsburg	80	19	41.2	4.49
Oregon †	88	30	49.3	4.34	Fairfield †	86	28	50.5	9.45
Oswego #1	84	24	44.8	4.80	Fort Madison #†	89	29	52.4	5.21
Ottawa †	88	26	48.2	5.23	Fulton †	82	30	46.5	3.50
Palatine †	84	28	54.5	9.12	Galva †	80	20	44.1	2.20
Pana #†	85	35	54.0	16.56	Glenwood †	96	24	52.0	2.04
Paris †	80	24	51.7	6.36	Grand Meadow #1	74	20	42.1	4.11
Peoria a †	85	30	51.9	7.93	Greenfield †	80	23	46.0	3.53
Peoria b †	85	30	51.9	7.86	Grinnell †	74	25	44.8	3.35
Philo †	83	25	49.5	8.28	Grundy Center †	76	22	43.4	5.52
Quincy †	84	30	50.0	6.14	Hampton †	77	19	40.4	6.18
Rantoul #1	84	30	50.0	7.23	Hawkeye	80	20	42.1	4.79
Riley †	84	23	43.9	3.71	Hopeville †	79	23	45.7	4.03
Rockford †	85	27	45.1	5.38	Hopkinton #1	78	28	46.0	4.00
Rushville	89	27	51.6	9.10	Independence †	78	19	42.3	1.95
Saint John #3	84	41	58.6	9.81	Indianola †	81	22	47.7	5.05
Shawneetown †	85	26	44.6	10.55	Iowa City a †	88	24	48.5	4.37
Streator †	85	26	49.6	6.17	Iowa City b †	76	20	41.1	3.88
Sycamore #1	85	26	44.6	4.59	Iowa Falls †	86	25	41.1	4.45
Tuscola #3	90	30	53.5	8.73	Keosauqua †	86	25	49.8	4.82
Walnut †	90	26	48.6	5.02	Larrabee †	80	18	42.8	3.93
Warsaw †	85	25	44.6	5.25	Le Claire †	86	20	47.3	5.51
Watseka #1	85	25	44.6	6.95	Logan †	86	20	47.3	5.51
White Hall #†	85	30	50.6	9.31	Marquette #1	86	29	45.8	4.36
Winnebago †	85	25	44.2	4.66	Marshall †	78	25	47.1	3.98
<b>Indiana.</b>					Mazon #1	80	25	46.6	4.63
Angola #1	80	25	44.4	7.31	Mechanicville	86	23	44.2	4.24
Ashboro †	81	30	55.0	6.60	Monticello #†	84	21	43.2	3.58
Bedford †	81	30	55.0	7.87	Moor †	87	21	50.8	6.24
Butlerville †	84	30	54.3	8.28	Mount Ayr †	83	20	48.9	3.31
Cambridge City †	83	29	51.2	9.53	Mount Pleasant a #1	85	25	46.8	4.02
Columbia City #1	78	28	46.6	6.29	Mount Vernon #1	82	25	47.0	4.00
Columbus #2	80	32	53.2	8.70	Murray †	77	23	46.4	4.70
Connersville †	82	31	51.8	9.95	Newton	82	21	46.3	5.41
Crawfordsville †	82	31	51.8	4.63	Osage #†3	82	21	46.3	5.41
Decatur Springs #6	80	33	58.0	7.96	Oskaloosa †	85	22	46.8	3.39
Delphi	78	26	47.7	7.47	Panamau †	81	21	45.8	2.27
Evansville †	81	31	50.8	7.14	Racine †	85	27	47.0	4.63
Farmland	81	31	50.8	10.79	Sac City †	82	21	41.4	3.60
Franklin #1	83	32	52.4	7.25	Seymour †	87	24	49.2	5.37
Hammond †	73	27	47.1	6.43	Storm Lake †	78	30	42.9	3.72
Hawpacth #†1	76	31	45.5	4.74	Tipton †	86	23	45.3	4.63
Jasper †	82	31	58.1	10.72	Villicut †	82	24	49.6	1.11
Jeffersonville †	83	32	57.2	8.23	Vinton #1	77	25	44.4	3.32
Kokomo †	83	30	51.2	8.42	Washington	84	26	49.0	4.21
Lacoma #1	85	32	56.8	5.61	Webster City #1	78	26	41.1	4.12
Lafayette †	82	27	50.3	9.65	Williams #1	75	20	41.3	5.00
Logansport a †	83	28	51.2	7.67	Winterset †	82	19	46.6	5.65
Logansport b †	83	28	51.2	6.91	<b>Kansas.</b>				
Madison a †	84	35	58.0	5.10	Abilene †	100	28	58.4	1.45
Madison b †	84	35	58.0	8.15	Allen #†2	90	26	50.0	0.18
Marengo #1	82	34	57.6	16.60	Altouma #†3	88	27	55.3	7.69
Marion †	74	32	51.3	8.45	Atchison †	94	28	53.2	3.13
Markle †	81	28	49.3	7.84	Beloit	94	28	53.2	0.45
Maunzy	81	28	50.8	9.11	Bucklin	90	28	53.2	T.
Michigan City	85	30	48.7	6.12	Buffalo Park #8	90	15	56.1	0.25
Mount Vernon b	81	33	58.2	8.95	Cawker City #1	96	30	54.2	0.20
Muncie #1	84	35	54.6	15.00	Colby †	88	13	47.6	0.52
New Albany #†1	87	32	57.8	9.59	Coldwater †	97	27	56.6	T.
Point Isabel †	80	34	52.5	9.57	Collyer #1	94	22	51.0	0.51
Princeton †	82	31	55.9	8.79	Columbus †	90	26	58.1	8.51
Rockville	81	25	52.0	9.86	Cunningham †	98	26	54.5	0.14
Rushville †	84	31	52.8	9.17	Downs	98	26	54.5	0.85
Seymour †	84	31	52.8	9.22	Ellis #1	94	30	52.0	T.
Shelbyville †	83	31	55.0	8.57	Emporia †	94	30	56.0	1.00
Terre Haute †	84	28	54.1	8.17	Englewood †	99	22	57.0	0.09
Union City	82	28	49.9	7.60	Eureka Ranch †	99	20	52.6	0.25
Valparaiso †	84	27	44.2	4.16	Fort Riley †	97	27	56.2	2.38
Vevy †	84	32	56.3	9.21	Gibson #1	94	21	50.3	0.26
Vincennes	85	30	50.0	10.60	Go City #†1	93	30	49.4	0.15
Worthington †	83	31	54.7	8.45	Grainfield	93	30	49.4	T.
<b>Indian Territory.</b>					Greensburg †	91	25	52.8	T.
Colbert †	84	31	52.8	4.35	Grenola	98	28	59.4	2.85
Eufula †	84	31	52.8	6.48	Grinnell #1	94	26	56.0	T.
Fort Supply	99	26	58.2	0.25	Havensville #†1	95	29	51.2	2.57
Gwendale †	98	35	59.0	5.93	Hays City †	91	30	56.1	0.20
Lehigh †	94	36	64.6	2.40	Hesston	93	26	53.2	0.19
Purcell †	102	33	65.5	1.11	Horton †	93	27	53.3	1.94
Sallisaw †	93	34	63.6	4.68	Hutchinson †	99	30	57.1	0.33
Tulsa †	93	34	63.6	7.61	Independence †	95	32	58.1	6.35
<b>Iowa.</b>					Kansas City †	91	27	53.6	4.34
Algona #1	76	24	43.4	4.25	Kellogg	98	28	58.5	1.34
Alta †	79	18	41.0	3.14	Kiowa †	103	27	60.0	0.07
Amana †	83	24	45.5	4.68	La Crosse †	89	32	56.4	0.56
Ames b	77	17	44.0	5.22	Lakin †	97	13	52.8	0.09
Ames c	77	17	44.0	5.58	Lawrence †	91	31	54.3	3.31
Ames (near) #1	76	22	44.3	3.85	Lebo †	96	25	57.3	2.89
Atlantic †	83	18	45.3	2.68	Leoti †	92	18	50.1	0.04
Audubon	76	20	45.9	3.21	Liberal †	95	24	54.2	0.17
Belle Plaine †	80	21	45.2	3.55	McAllaster #3	92	27	55.7	0.10
Blakeville #1	80	23	43.0	3.49	Mackaville †	92	27	55.7	T.
Bonsaparte †	80	23	47.5	5.11	McPherson †	97	28	55.8	0.51
Carroll †	75	21	44.9	3.81	Manhattan a †	98	26	54.4	1.28
Cedar Rapids †	78	24	45.9	3.89	Manhattan b #1	98	28	53.6	1.21
Centerville †	85	18	48.2	4.80	Mankato †	96	11	50.2	T.
Charles City †	80	23	47.7	3.11	Marion †	97	29	55.2	1.89
Clarinda †	81	23	47.7	3.11	Marmaton #1	92	24	50.0	7.31
Clinton †	87	24	46.7	5.48	Medicine Lodge	99	36	54.9	0.00
College Springs	80	24	46.8	3.80	Minneapolis †	88	31	44.5	0.42
Corning b †	79	20	47.0	3.76	Monument #1	99	31	44.5	0.42
Cresco †	77	15	39.6	5.95					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<b>Kansas—Cont'd.</b>					<b>Louisiana—Cont'd.</b>				
Morland f.....	95	18	49.9	0.47	Shell Beach.....	86	50	72.0	3.38
Morton f.....	89	24	52.8	4.12	Sugar Ex. Station f.....	90	47	70.1	4.00
Morton f.....	93	23	53.9	0.15	Thibodeaux.....	88	45	71.8	3.08
Mount Hope f.....	92	33	55.4	0.34	Wallace.....	89	31	66.9	2.40
Norton f.....	90	20	49.4	0.06	<b>Maine.</b>				
Oberlin f.....	97	28	56.9	7.33	Bar Harbor.....	57	14	38.5	3.64
Owego f.....	97	28	56.9	7.33	Belfast f.....	58	24	39.2	3.21
Page City f.....	96	29	44.4	0.10	Calais f.....	61	12	38.2	2.20
Pauline.....	96	26	55.0	1.38	Cornish f.....	59	18	38.0	2.59
Phillipsburg f.....	92	20	52.7	0.25	East Machias f.....	57	13	36.8	2.06
Plainville.....	93	10	51.8	0.33	Easton f.....	56	2	33.0	1.86
Pleasant Dale f.....	94	23	51.8	0.32	Fairfield.....	59	13	37.6	2.13
Quinter f.....	93	10	51.8	0.33	Farmington f.....	59	5	36.4	2.34
Rome f.....	97	30	58.1	0.49	Fort Kent f.....	63	7	31.8	1.20
Sedan f.....	95	32	58.8	4.16	Gardiner f.....	63	14	38.5	2.52
Sharon Springs f.....	94	32	54.4	0.10	Houlton f.....	59	3	34.0	1.57
Shields f.....	96	24	54.4	0.17	Kennebec Arsenal f.....	68	15	36.8	1.40
Sterling f.....	97	28	59.2	0.09	Kents Hill.....	59	12	37.1	2.83
Syracuse f.....	93	21	52.3	0.12	Lewiston f.....	63	16	36.3	2.58
Topoka.....	96	24	55.0	2.47	Mattawamkeag f.....	57	3	35.1	1.86
Tribe f.....	90	18	49.9	0.09	Mayfield f.....	60	10	34.3	1.86
Ulysses f.....	93	25	55.6	0.23	Petit Menan f.....	55	25	38.2	.....
Wa Keeney f.....	94	30	51.7	0.40	Presque Isle.....	53	4	32.8	.....
Wakefield f.....	97	30	55.7	1.99	West Jonesport f.....	56	15	36.3	.....
Wallace f.....	94	30	55.0	0.04	<b>Maryland.</b>				
Wamego f.....	97	34	54.3	2.25	Barron Crk Spgs f.....	75	35	56.9	5.42
Winona f.....	86	20	46.4	0.27	Benedict f.....	81	42	58.6	3.28
Yates Center f.....	96	.....	.....	5.00	Boettcheville f.....	92	34	51.4	4.10
<b>Kentucky.</b>					Cambridge.....	78	40	57.6	3.47
Bowling Green f.....	84	27	57.0	7.12	Cumberland f.....	88	32	52.3	3.90
Burnside f.....	76	31	52.6	14.30	Cumberland f.....	86	37	55.3	3.90
Caddo f.....	85	38	61.0	7.02	Darlington f.....	78	32	49.9	3.18
Canton f.....	80	33	53.8	11.10	Denton f.....	82	33	53.2	3.77
Carrollton f.....	82	40	59.6	5.54	Easton f.....	80	37	55.0	3.38
Cattlettsburg f.....	86	36	62.4	10.91	Edgemont.....	76	31	50.6	.....
Earlington f.....	83	31	58.0	.....	Fallston f.....	78	35	50.6	4.00
Eddyville f.....	83	31	58.0	.....	Fenby f.....	78	35	50.6	4.00
Edmonton f.....	83	31	58.0	.....	Frederick f.....	78	34	52.8	4.80
Falmouth f.....	83	31	58.0	.....	Glyndon f.....	78	33	50.0	4.83
Frankfort f.....	83	31	58.0	.....	Great Falls f.....	77	39	54.0	2.69
Franklin f.....	85	35	61.6	6.84	Jewell f.....	77	39	54.0	2.69
Greensburg f.....	80	34	58.3	5.61	Leonardtown f.....	82	36	52.6	4.16
Harrodsburg f.....	86	35	56.3	6.57	McDonogh.....	76	34	51.0	3.72
Hendricks f.....	90	26	60.3	7.30	Mt. St. Marys Col f.....	80	30	51.3	5.05
Lancaster f.....	81	32	54.2	9.53	New Market f.....	78	30	51.2	3.36
Louisville f.....	90	27	58.1	5.19	Oakland f.....	81	38	47.4	6.75
Madison f.....	86	34	63.1	5.97	Solomons f.....	81	32	54.0	3.54
Middlesboro f.....	86	38	59.1	4.74	Sunnyside f.....	81	22	46.2	1.10
Mount Sterling f.....	87	29	54.5	7.65	Taneytown f.....	79	33	52.2	3.61
Munfordville f.....	83	34	61.3	5.86	<b>Massachusetts.</b>				
Paducah f.....	88	36	62.0	7.08	Adams f.....	68	21	43.6	.....
Paducah f.....	88	36	62.0	7.08	Amherst f.....	66	19	43.5	3.46
Pellville f.....	94	32	59.0	7.15	Amherst Ex. St'n f.....	66	20	42.5	3.66
Princeton f.....	84	28	60.0	7.10	Amherst Ex. St'n f.....	66	19	43.5	3.46
Richmond f.....	84	28	60.0	7.10	Andover f.....	66	21	43.2	3.04
Russellville f.....	84	34	60.5	7.03	Ashland.....	66	21	43.2	3.04
Shelby City f.....	84	32	57.8	5.54	Bedford.....	70	17	43.7	.....
Shelbyville f.....	83	29	55.8	7.30	Beverly Farms.....	64	20	40.9	4.29
South Fork f.....	83	29	55.8	7.30	Blue Hill (sum't).....	67	24	42.2	3.05
Springfield f.....	87	31	57.6	5.95	Blue Hill (valley).....	70	18	42.8	2.84
Versailles.....	83	35	61.4	5.33	Boston.....	71	21	43.8	2.66
Wickliffe f.....	83	35	61.4	5.33	Cambridge f.....	71	21	43.8	2.66
Williamsburg f.....	83	35	61.4	5.33	Cambridge f.....	67	15	43.3	3.25
<b>Louisiana.</b>					Chestnut Hill.....	69	29	44.6	3.32
Abbeville f.....	93	44	71.4	3.72	Clinton.....	67	18	42.0	2.60
Alexandria f.....	90	36	70.4	2.22	Concord f.....	67	18	42.0	2.60
Amito f.....	88	45	69.6	2.89	Dudley f.....	70	22	41.6	2.65
Baton Rouge f.....	86	48	70.4	1.99	Egg Rock, Nahant.....	62	26	41.0	.....
Calhoun.....	89	37	68.5	7.22	Fall River f.....	65	29	44.0	4.83
Cameron f.....	89	36	69.4	3.44	Fiskdale.....	66	24	40.9	2.78
Cheneyville f.....	89	46	72.7	3.25	Fitchburg f.....	65	17	41.4	2.78
Clinton f.....	90	.....	.....	3.08	Frammingham.....	71	16	43.8	3.54
Coushatta f.....	93	39	69.4	2.62	Gilbertville f.....	70	19	39.8	2.98
Coushatta f.....	93	39	69.4	2.62	Great Barrington f.....	64	20	41.6	.....
Dalhousie f.....	88	52	73.2	1.71	Groton f.....	68	15	40.6	3.10
Donaldsonville f.....	86	50	70.9	3.07	Hyannis f.....	60	26	43.6	4.86
Emilie f.....	90	39	68.0	7.96	Kendall Green f.....	70	22	44.0	2.82
Farmerville.....	86	42	71.8	2.70	Lake Cochituate.....	73	12	43.8	3.29
Franklin f.....	86	42	71.8	2.70	Lawrence.....	70	21	43.5	2.84
Girard f.....	87	48	72.2	2.12	Leeds.....	68	17	41.8	3.31
Grand Coteau f.....	89	42	70.2	2.81	Leicester.....	65	15	41.2	1.52
Hammond f.....	96	40	68.7	8.87	Leominster f.....	66	20	43.2	3.07
Homer f.....	89	48	72.4	5.60	Long Plain f.....	61	24	39.6	6.16
Houma f.....	90	44	72.1	3.11	Lowell f.....	61	18	40.7	2.93
Jefferson f.....	90	44	72.1	3.11	Lowell f.....	67	16	41.8	.....
Lafayette f.....	87	41	70.8	1.07	Lowell f.....	68	20	43.2	.....
Lake Charles f.....	92	48	73.0	3.67	Ludlow Center.....	65	16	40.5	3.80
Lake Providence f.....	92	48	73.0	3.67	Lynn f.....	68	21	43.2	3.41
Liberty Hill.....	89	40	70.4	4.85	Lynn f.....	75	23	45.5	.....
Many f.....	89	40	70.4	4.85	Mansfield f.....	78	25	42.8	4.72
Maurepas.....	91	43	72.3	3.10	Middleboro.....	73	15	43.0	3.41
Melville f.....	89	50	72.9	2.43	Milton f.....	68	20	42.1	1.92
Monroe f.....	88	44	69.8	5.26	Monroe f.....	59	11	37.4	4.04
Natchitoches f.....	91	38	68.3	2.83	Monson f.....	66	18	42.6	3.60
New Iberia.....	86	50	73.8	1.10	Mystic Lake.....	59	.....	.....	3.37
Opelousas f.....	88	45	71.3	1.48	Mystic Station.....	59	.....	.....	3.42
Oxford f.....	89	46	71.9	2.63	New Bedford f.....	59	25	42.1	5.13
Plain Dealing.....	95	37	67.6	7.05	New Bedford f.....	63	21	42.5	4.63
Plaquemine.....	89	50	72.6	1.81	Newburyport f.....	71	.....	.....	1.71
Rayne f.....	89	44	71.3	1.57	North Billerica f.....	70	20	43.4	2.46
Roseland.....	88	45	70.9	2.60					
Schriever f.....	89	47	71.3	3.63					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<b>Massachusetts—Con.</b>					<b>Minnesota—Cont'd.</b>				
Plymouth f.....	66	28	45.8	4.45	Collegeville.....	63	15	38.7	6.85
Provincetown.....	61	19	41.9	3.27	Crookston f.....	53	4	32.7	.....
Randolph.....	61	19	41.9	3.27	Farmington f.....	70	19	38.0	4.22
Roberts Dam.....	69	26	44.6	3.69	Fergus Falls f.....	59	12	34.6	3.59
Roxbury.....	62	26	43.4	1.10	Fort Ripley f.....	.....	.....	.....	4.40
Royalton f.....	62	26	43.4	1.10	Grand Meadow f.....	68	22	37.1	4.10
Salem f.....	62	26	43.4	1.10	Granite Falls.....	72	16	38.2	3.64
Somerset f.....	78	24	46.4	4.20	Holland f.....	75	14	35.9	4.59
South Dennis f.....	59	17	41.4	7.68	Kimbria f.....	74	12	36.1	5.62
Springfield Arm'y.....	67	23	44.2	4.49	L Winnibigoshish f.....	55	11	32.4	2.90
Taunton f.....	71	20	44.6	3.80	Leech Lake f.....	56	11	32.6	3.49
Taunton f.....	73	20	44.6	3.48	Long Prairie f.....	63	11	35.2	5.67
Turners Falls.....	64	22	43.2	3.12	Maple Plain.....	70	20	38.1	5.35
Wakefield f.....	69	18	43.2	3.42	Minneapolis f.....	70	19	39.2	6.22
Waltham.....	69	18	43.2	3.42	Minneapolis f.....	64	20	38.2	.....
Wayland.....	75	12	42.8	2.86	Minnetonka City f.....	74	20	41.2	3.74
Webster.....	66	24	45.8	3.75	Montevideo f.....	71	12	37.7	6.14
Wellesley.....	66	24	45.8	3.75	Morris f.....	63	15	35.2	5.20
Westboro f.....	72	17	44.3	3.59	New London f.....	60	15	34.6	4.80
Williamstown f.....	64	19	40.8	2.43	Northfield f.....	74	21	37.0	.....
Winchester.....	69	23	42.6	3.23	Ortonville f.....	.....	.....	.....	5.48
Winthrop.....	66	22	41.4	.....	Park Rapids f.....	55	8	32.5	5.19
Worcester.....	66	21	41.4	3.56	Pine River f.....	56	13	34.0	3.00
Worcester f.....	66	21	41.4	3.56	Pokegama Falls f.....	54	10	31.1	2.87
<b>Michigan.</b>					Redwood Falls f.....	.....	.....	.....	5.06
Adrian.....	80	21	45.3	5.46	Rochester f.....	74	21	39.2	2.70
Albion f.....	76	32	46.0	6.58	Rolling Green f.....	73	21	38.8	5.27
Allegan.....	79	23	45.6	5.65	Saint Charles f.....	73	10	38.5	5.27
Alma.....	77	25	42.6	5.95	Saint Cloud f.....	61	20	37.5	5.74
Ann Arbor f.....	78	23	44.4	6.25	Saint Olof f.....	58	12	34.7	3.38
Arbela f.....	74	18	42.2	5.35	Sandy Lake Dam f.....	55	7	32.4	4.56</



Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Missouri—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Nebraska—Cont'd.</i>	°	°	°	<i>Ins.</i>
Grove Dale	96	27	55.8	11.10	Franklin	90	20	51.5	0.39
Harrisonville	96	27	55.8	5.56	Fremont	83	28	46.5	2.38
Hastain	90	22	54.4	10.48	Geneva	81	26	46.7	0.63
Hermann	86	23	56.8	9.85	Genoa	81	27	46.7	2.22
Humansville	86	23	56.8	9.85	Gering	80	20	42.6	0.77
Irena	83	32	57.7	4.58	Glenwood	80	18	41.6	1.03
Ironton	88	31	58.3	10.56	Haigler	88	26	47.5	0.10
Lamar	88	31	58.3	10.56	Harrison	75	16	35.8	1.55
Lamotte	86	32	52.5	8.57	Hartington	80	19	44.3	4.05
Langdon	95	22	49.4	1.24	Harvard	92	26	48.4	0.73
Lebanon	87	30	58.0	13.17	Hay Springs	72	16	39.0	1.43
Lexington	89	25	53.7	6.77	Hebron	95	22	51.1	0.56
Liberty	93	29	55.5	5.23	Holdrege	85	25	46.5	0.39
Louisiana Bridge	86	32	52.5	7.77	Imperial	85	30	50.1	0.00
McCune	86	32	52.5	7.77	Indianola	100	18	49.8	T.
Malden	86	32	52.5	7.77	Kennedy	74	21	42.6	1.27
Mansfield	83	28	56.4	9.98	Kimball	80	15	43.2	0.74
Marble Hill	83	28	56.4	9.98	Lexington	96	11	54.2	2.30
Marceline	89	23	53.2	5.75	Lincoln	91	25	49.4	0.39
Marshall	89	23	53.2	5.75	Lynch	77	22	44.5	3.55
Mexico	87	27	53.2	8.46	Madrid	78	20	45.7	0.10
Miami	92	30	53.9	6.93	Marquette	83	21	45.7	0.44
Mine La Motte	86	29	59.1	7.98	Minden	84	20	47.5	0.60
Mount Vernon	86	29	59.1	7.98	Mullen	71	18	44.2	0.60
Neosho	94	25	58.6	9.00	Nebraska City	85	26	49.2	0.63
New Boston	78	24	44.1	6.12	Nesbit	81	15	46.6	0.15
New Hartford	90	26	57.7	8.69	Norfolk	79	22	43.9	2.55
New Haven	88	30	55.0	10.38	North Loup	78	18	48.2	0.94
New Palestine	88	29	56.8	11.08	O'Neill	81	20	44.2	2.19
Oakfield	88	29	56.8	11.08	Ough	82	18	43.3	0.50
Oak Ridge	81	30	56.0	8.83	Palmer	82	18	43.3	1.90
Olden	90	28	59.6	8.04	Plattsmouth	82	24	44.1	2.95
Oregon	92	28	51.8	3.12	Ponca	82	19	48.0	0.99
Oregon	90	26	50.9	3.02	Ravenna	82	19	48.0	0.99
Oseola	88	29	56.8	11.08	Red Cloud	80	21	45.7	3.50
Oto	88	29	56.8	11.08	Santee Agency	75	25	47.8	0.65
Palmyra	89	23	56.6	10.89	Seward	76	16	42.6	2.47
Panacea	89	23	56.6	10.89	Springview	76	16	42.6	2.47
Paris	90	22	52.2	3.50	Stanton	94	22	49.1	4.10
Phillipsburg	85	31	58.0	8.93	State Farm	94	22	49.1	4.10
Pickering	84	26	46.3	3.71	Superior	89	26	48.9	T.
Platte River	84	24	49.2	3.36	Syracuse	89	27	50.2	0.75
Poplar Bluff	91	29	61.2	10.97	Table Rock	84	26	51.7	0.91
Princeton	83	20	50.3	5.46	Tekamah	84	20	47.5	1.73
Rea	83	24	49.4	3.45	Turlington	82	25	52.5	0.87
Rolla	88	32	55.6	11.01	Wallace	86	16	46.1	0.20
Round Springs	88	32	55.6	11.01	Weeping Water	87	21	45.8	1.00
Saint Joseph	87	28	55.4	11.34	West Point	80	23	44.5	2.00
Saint Louis	87	28	55.4	11.34	Whitman	76	18	37.9	0.62
Sedalia	91	27	54.4	10.06	Wilcox	85	30	56.3	0.87
Shelbina	84	25	50.0	4.49	<i>Nevada.</i>				
Stanberry	86	27	55.3	7.80	Austin	63	10	35.0	2.86
Steelville	86	27	55.3	7.80	Battle Mountain	72	30	47.2	1.18
Stellards	91	28	56.0	8.77	Belleville	79	12	41.9	0.80
Sublett	86	26	50.4	8.21	Belmont	61	12	37.0	0.66
Unionville	86	19	47.2	5.99	Beowawe	66	22	37.7	1.32
Vermont	85	30	53.5	10.77	Brown	70	32	49.3	1.00
Virgin City	87	31	55.0	7.07	Candelaria	66	20	44.5	T.
Warrensburg	87	31	55.0	7.07	Carlisle	66	28	39.4	1.05
Warrenton	87	28	54.4	6.72	Carson City	68	17	44.0	1.01
West Plains	85	27	52.8	10.42	Crowe Ranch	75	22	49.3	0.64
Whiteside	85	27	52.8	10.42	Danversville	64	30	39.9	0.20
<i>Montana.</i>					Ely	69	10	39.0	1.50
Boulder	68	4	36.0	1.31	Empire Ranch	60	10	34.0	1.30
Camp Poplar River	60	18	37.7	2.00	Enpencil	65	25	40.8	0.75
Choteau	75	12	37.8	0.95	Genoa	68	19	41.6	1.40
Columbia Falls	68	19	37.8	2.68	Golconda	69	26	40.5	0.87
Corbin	65	9	36.6	.....	Halleck	60	24	37.0	2.87
Deer Lodge City	70	3	38.8	1.18	Hawthorne	68	30	37.0	2.95
Dry Fork	77	13	39.4	0.75	Hawthorne	71	16	46.8	0.17
Fort Keogh	79	11	39.1	0.71	Hot Springs	69	28	50.2	0.57
Fort Logan	61	9	33.4	1.64	Humboldt	60	28	43.0	0.90
Fort Missoula	69	20	39.8	2.00	Lewers Ranch	66	17	42.1	1.68
Glendive	81	15	40.7	0.69	Lovelock	68	30	43.3	0.00
Great Falls	75	16	41.9	0.82	McDermitt	69	14	40.5	0.91
Martinsdale	64	12	36.8	0.69	Mill City	64	28	41.7	1.29
Mingusville	74	22	48.1	.....	Monitors Ranch	67	11	39.9	T.
Virginia City	65	16	36.2	0.84	Palisade	68	26	40.8	1.35
<i>Nebraska.</i>					Palmetto	69	14	43.8	0.60
Agee	80	26	45.5	2.56	Pioche	76	17	46.0	0.10
Ansel	83	15	48.4	0.82	Reno	72	30	49.1	0.50
Arberville	92	22	45.7	0.67	Reno State Univ'ty.	68	19	42.0	0.58
Arcadia	92	26	48.3	1.13	Saint Clair	76	19	46.4	0.52
Ashland	78	18	45.3	0.74	South Camp	62	12	36.8	1.48
Bassett	90	21	38.7	4.14	Stofel	60	0	33.2	3.20
Beatrice	93	27	51.4	0.39	Sunnyside	77	15	46.0	0.68
Beaver City	86	17	49.8	0.36	Tecoma	69	30	42.6	0.35
Belvidere	93	26	49.9	0.40	Toano	55	28	37.4	0.85
Burwell	70	8	44.2	1.20	Tuscarora	60	10	35.2	1.30
Callaway	79	14	45.9	0.94	Tybo	67	15	42.4	0.89
Cooleyton	79	14	45.9	0.94	Verdi	68	18	42.5	1.10
Cornelia	75	20	42.4	2.53	Virginia City	63	17	42.0	1.45
Creighton	84	23	42.9	1.75	Wabaska	74	34	52.5	0.24
David City	84	23	42.9	1.75	Wells	52	26	38.7	0.85
De Soto	82	26	48.7	1.85	Winnemucca	70	28	47.2	0.99
Dunning	81	27	43.9	1.86	<i>New Hampshire.</i>				
Ericson	83	22	45.1	1.91	Belmont	57	1	33.4	.....
Ewing	91	28	52.5	0.84	Berlin	59	0	34.9	2.51
Fairbury	83	17	42.8	1.30	Berlin Mills	56	10	35.2	1.92
Fort Robinson	82	1	38.4	0.33	Bethlehem	65	23	42.2	0.98
Fort Sidney	82	1	38.4	0.33	Brookline	62	14	37.8	2.47
					Concorda	61	17	37.6	2.74

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>N. Hampshire—Con.</i>	°	°	°	<i>Ins.</i>	<i>New York—Cont'd.</i>	°	°	°	<i>Ins.</i>
Durham	67	20	42.1	2.15	Angelica†	73	23	41.0	4.37
East Canterbury	63	14	37.9	2.29	Arcade†	68	15	39.0	4.47
Grafton†	66	11	37.9	1.80	Arkwright	66	24	40.6	.....
Groveton*†	60	0	34.7	.....	Atlanta	66	24	40.6	3.68
Hanover a†	60	14	38.2	1.64	Avon	74	24	42.0	2.18
Keene	68	17	41.8	2.20	Baldwinsville†	74	24	42.0	4.38
Lakeport	56	5	35.8	2.57	Bedford	71	25	43.1	4.12
Lancaster	56	5	35.8	2.59	Binghamton†	71	25	43.1	3.36
Littleton†	60	9	35.3	2.04	Bolivar	65	23	43.6	4.49
Manchester†	66	18	42.2	1.94	Brentwood†	65	23	43.6	3.40
Mine Falls	67	17	41.9	2.73	Brookport	76b	19h	43.0h	3.62
Nashua	67	17	41.9	2.68	Brookfield†	65	23	39.8	1.71
Newton	67	14	41.0	2.70	Canton†	69	15	39.2	2.29
North Conway	64	7	36.5	2.55	Carthage†	66	13	38.4	2.67
Pennichuck Station	60	8	34.8	2.46	Chenango Forks	66	23	41.5	2.37
Plymouth†	60	8	34.8	2.42	Cherry Creek	66	23	41.5	5.08
Sanbornton	61	13	36.7	1.78	Constableville†	61	13	37.8	2.62
Stratford	67	2	38.6	1.82	Cooperstown†	63	24	39.8	2.96
Tilton	61	16	38.0	.....	Cortland	66	27	41.0	3.12
Wiers Bridge	58	0	33.8	2.23	Demeter	70	27	41.4	3.70
West Milan	58	0	33.8	2.70	Dunkirk	70	27	41.4	3.70
Wolfboro	58	0	33.8	1.73	Easton	68	20	44.0	3.11
<i>New Jersey.</i>					Eden Center	68	20	44.0	6.92
Allaire	78	23	48.1	.....	Ellis	74	31	46.6	3.55
Asbury Park	75	30	47.4	6.63	Elmira*†	74	31	46.6	3.55
Barneget	74	27	52.4	6.29	Factoryville†	72	24	43.9	3.39
Bayonne	75	29	48.7	5.20	Fleming†	73	23	41.9	2.62
Belvidere	69	27	46.4	3.88	Fort Niagara	68	26	43.6	3.70
Beverly†	82	29	49.5	5.58	Friendship	74	22	41.7	4.34
Billingsport L. H.*†	76	38	50.7	5.42	Geneva†	79	25	43.1	3.94
Boonton	75	36	53.3	5.31	Gloversville†	66	19	39.3	3.57
Bridgeport a	75	36	53.3	4.11	Hammondsport*†	74	20	42.2	.....
Camden	78	30	50.9	5.73	Honeymead Brook†	70	24	44.0	2.93
Cape May	75	34	50.2	5.75	Humphrey†	70	22	41.6	5.61
Charlotteburg	75	41	46.4	3.74	Ithaca†	75	25	41.5	3.79
Deckertown	73	43	45.3	3.71	Jamestown*†	59	25	44.8	.....
Dover	74	22	46.0	3.93	Kings Station	74	24	43.5	3.18
Egg Harbor City†	76	27	49.4	5.46	Lebanon Springs	64	13	40.5	4.68
Elizabeth†	75	32	47.7	6.20	Le Roy	72	24	42.5	3.82
Franklinville	76	26	50.4	4.95	Little Valley	67	27	44.5	4.28
Freehold†	74	30	49.4	5.15	Lockport	67	27	44.5	4.01
Friesburg	74	30	47.1	3.79	Lowville	66	18	38.9	3.89
Gillette	74	30	47.1	5.15	Lyons†	74	25	42.2	1.67
Hammononton	77	28	49.6	5.48	Madison Barracks	67	15	39.8	3.08
Hanover	77	28	49.6	3.97	Malone	66	11	37.1	3.44
Highland Park†	77	29	49.0	4.89	Middletown†	72	26	42.5	3.67
Hightstown†	77	31	48.4	5.11	Minnewaska*†	65	21	41.5	4.20
Imlaystown	78	33	50.1	5.91	Mount Morris	74	19	43.4	3.08
Junction	78	29	49.8	2.97	Newark Valley	67	20	38.5	3.49
Lambertville	78	29	49.8	4.86	Newfield Summit	67	20	38.5	.....
Locktown	75	29	48.5	5.44	New Lisbon†	63	21	39.1	3.30
Millville	76	34	54.0	3.40	N'th Hammond†	68	16	39.3	3.52
Moorestown†	76	31	49.4	5.93	Number Four†	62	14	36.7	3.08
Newark a	72	32	47.0	5.75	Ogdensburg†	74	13	38.8	1.95
Newark b†	75	33	48.2	5.36	Oxford	66	23	41.8	4.89
New Brunswick a	78	30	50.5	5.61	Palmertown†	71	22	40.0	3.66
New Brunswick b.	74	29	47.6	5.62	Perry City†	72	22	40.8	3.66
Newton†	74	19	45.8	3.40	Phoenix	73	29	43.5	3.79
Ocean City	65	34	47.8	7.08	Plattsburg B'ks	66	13	37.6	2.11
Oceanic	76	35	51.0	6.08	Port Jervis	74	26	46.0	3.61
Paterson	77	30	50.0	5.44	Potsdam†	67	13	37.6	3.07
Pensauken	76	35	51.0	5.58	Poughkeepsie	74	22	46.2	2.98
Plainfield	76	28	49.0	5.91	Quaker Street	64	18	39.8	3.15
Rancocas*	75	34	51.8	5.05	Rome	70	23	43.7	3.97
Readington*†	70	36	53.4	.....	Romulus	74	25	43.8	3.02
River Vale†	77	28	47.1	4.37	Rondout†	69	26	44.2	4.20
Salem	74	31	53.3	4.80	Setauket†	65	30	44.2	4.95
Somerville	78	27	50.0	5.38	South Canisteo†	73	23	44.0	5.84
South Orange†	74	30	46.8	6.81	South Kortright†	68	19	40.7	3.38
Tenafly†	79	22	47.0	4.25	Turin	60	16	37.0	4.13
Toms River	79	27	49.1	7.12	Utica	67	22	41.2	3.48
Trenton	74	33	50.5	6.53	Varsburg	74	16	41.9	3.62
Vineland	76	29	51.7	3.97	Victor	75	24	42.5	3.27
Whiting	80	30	50.4	5.12	Wappingers Falls	72	26	45.7	3.43
Woodbine	76	30	50.1	6.16	Watertown	70	16	40.3	.....
<i>New Mexico.</i>					Watkins†	78	25	43.5	2.96
Albert†	86	25	57.2	0.07	Wedgwood†	74	22	39.7	3.55
Albuquerque†	82	26	55.4	T.	West Chazy	73	28	47.7	3.57
Chama†	72	10	42.1	0.30	West Point†	73	28	47.7	3.57
Clayton†	81	33	57.7	T.	Willets Point	77	31	46.8	5.33
Deming*†	88	54	70.4	0.00	<i>North Carolina.</i>				
East Las Vegas†	85	20	49.8	0.00	Asheville†	89	26	57.7	1.95
Embudo	73	22	53.1	0.00	Bailey	80	21	55.4	3.20
Folsom†	79	7	46.8	0.50	Bakersville†	90	21	55.4	3.46
Fort Bayard	79	26	54.7	0.00	Blowing Rock†	83	22	51.5	4.42
Fort Wingate	71	21	47.6	0.00	Bryson City†	80	21	51.5	3.84
Gallinas Spring†	85	25	56.2	0.00	Chapel Hill†	93	36	62.0	1.49
Halls Peak†	71	10	43.9	T.	Columbus†	76	36	55.8	5.69
Hillsboro†	84	33	60.7	0.00	Douglas	93	26	55.8	5.69
La Luz†	85	35	61.6	0.00	Experiment† Farm	89	37	63.0	1.24
Las Cruces†	91	29	58.5	0.00	Fayetteville†	89	37	63.0	1.63
Lordsburg*†	84	48	65.0	0.00	Flat Rock†	85	25	58.0	.....
Los Lunas†	86	26	56.6	0.00	Highlands†	80	27	54.5	7.08
Monero†	71	9	41.2	0.17	Horse Cove†	84	31	57.1	5.24
Olio†	77	21	51.6	T.	Lenoir*†	87	32	59.6	2.50
Roswell†	92	27	61.8	0.00	Lewiston	89	32	59.6	3.71
Socorro†	90	27	60.2	0.00	Lillington†	89	32	59.6	2.03
Springer†	83	13	49.6	0.25	Littleton†	89	32	60.0	0.88
Taos†	76	13	46.1	1.5	Louisburg†	88	34	61.7	1.28
<i>New York.</i>					Lynn*†	89	32	60.4	4.42
Adams Center	74	27	43.7	2.41	Marion	90	25	59.0	3.00
Addison†	74	27	43.7	3.50	Morgantown*†	90	30	61.4	3.70
Akron	67	28	47.3	3.77	Mount Airy†	89	27	56.6	2.69
Alfred Center	67	23	39.7	2.23	Mount Holly†	89	27	56.6	1.87
Amersand†	62	12	36.1	2.95	Mount Pleasant†	91	35	61.8	1.59

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>N. Carolina—Cont'd.</i>					<i>Ohio—Cont'd.</i>				
Murphy t.....	88	40	60.8	3.21	McArthur.....	91	27	53.6	4.80
Newbern t.....	87	31	59.2	2.29	McConellsville.....	90	26	51.9	5.25
Oak Ridge t.....	90	33	60.0	2.45	McLuney.....	91	24	52.7	5.52
Pittsboro.....	92	37	63.7	2.00	Mansfield t.....	90	25	51.9	7.59
Raleigh * t.....	95	42	68.1	2.00	Marietta t.....	90	33	55.5	5.32
Rockingham t.....	91	31	60.1	1.63	Marietta b.....	83	27	48.9	7.05
Saxon t.....	86	33	62.7	2.03	Millport.....	81	24	48.2	6.78
Salisbury.....	90	24	58.8	3.00	Montpelier.....	80	25	45.8	6.04
Shelby t.....	88	38	62.3	3.24	Mountville.....	82	23	46.4	5.55
Sloan.....	90	42	64.5	1.51	Napoleon.....	82	23	46.4	5.27
Smithfield.....	92	39	63.6	2.33	Nelsonville.....	80	28	50.7	5.95
Soapstone M't t.....	91	32	59.4	2.20	New Alexandria.....	86	25	50.2	4.01
Southern Pine t.....	92	34	62.7	2.10	New Berlin.....	86	25	50.2	7.37
Weldon t.....	89	34	61.2	0.96	New Holland.....	88	25	51.8	7.97
Wilmington.....	90	34	61.6	1.18	North Lewisburg.....	83	26	50.5	9.20
<i>North Dakota.</i>					North Royalton.....	80	25	45.6	4.47
Ashley t.....	63	6	36.0	1.95	Northwood.....	85	26	48.9	9.04
Berlin t.....	63	1	35.1	2.84	Oberlin.....	83	27	46.9	5.10
Bottineau t.....	60	5	31.2	0.10	O. S. University.....	86	26	51.2	7.08
Churchs Ferry t.....	60	0	33.3	0.77	Orangeville.....	77	25	47.8	4.45
Dawson.....	64	0	36.1	0.42	Pattakala.....	88	26	52.8	7.82
Dickinson t.....	67	12	39.3	0.45	Plattsburg.....	84	25	50.3	7.02
Ellendale t.....	65	7	38.0	3.04	Pomeroy.....	90	29	55.2	3.72
Fargo t.....	59	10	32.6	2.63	Portsmouth a t.....	85	30	53.9	5.91
Forman t.....	62	10	36.6	3.90	Portsmouth b t.....	85	30	53.9	5.91
Fort Stevenson t.....	64	2	35.6	0.62	Ridgeville Corners.....	85	30	53.9	5.91
Fort Yates t.....	66	1	40.2	1.62	Rittman.....	80	23	47.5	5.42
Gallatin t.....	64	4	38.2	2.24	Sharon Center.....	80	28	51.3	6.93
Grafton t.....	58	3	30.2	1.73	Shenandoah.....	80	28	51.3	6.93
Grand Forks t.....	50	9	30.9	3.37	Sidney t.....	80	28	51.3	6.93
Jamestown t.....	59	9	35.6	2.78	Springboro.....	80	28	51.3	6.93
Kelso t.....	52	2	32.1	2.30	Stroasville.....	82	22	47.0	4.21
Lakota t.....	58	2	32.9	0.60	Sylvania.....	91	27	55.4	4.33
Mayville.....	46	4	30.6	0.18	Tiffin t.....	81	29	49.4	5.25
Medora t.....	77	15	39.3	2.10	Tyrone.....	88	26	51.1	7.49
Milton t.....	70	8	30.6	1.37	Upper Sandusky.....	80	31	49.1	6.44
Minto t.....	65	4	33.5	1.25	Vanceburg.....	83	26	46.2	7.35
Napoleon t.....	68	10	32.9	0.59	Vermillion.....	80	25	47.0	4.14
Oakdale t.....	65	10	32.9	0.59	Vickery.....	82	23	46.0	6.06
Power t.....	54	12	33.4	1.22	Walnut.....	90	29	54.4	7.79
Reynolds.....	50	7	31.4	3.98	Warren.....	82	23	46.0	6.06
Saint John t.....	53	3	31.0	1.28	Wauseon.....	90	29	54.4	7.79
Sykeston t.....	68	10	39.8	0.55	Waverly.....	86	26	46.2	7.35
Valley City t.....	58	10	37.0	3.98	Waynesville.....	84	29	51.2	7.37
Wahpeton t.....	62	13	37.0	3.98	Wellington.....	84	29	51.2	7.37
Will Rice t.....	61	6	33.0	0.51	West Milton.....	82	30	51.2	7.37
Willow City t.....	55	7	28.9	0.68	Wheeler t.....	82	30	51.2	7.37
Woodbridge t.....	72	13	40.0	0.61	Woooster a.....	83	24	50.1	5.66
Yule t.....	72	13	40.0	0.61	Woooster b t.....	79	26	47.8	4.61
<i>Ohio.</i>					Youngstown.....	79	26	47.8	4.61
Akron.....	81	27	48.4	5.49	<i>Oklahoma Ter.</i>				
Annapolis.....	87	25	47.9	5.94	Anadarko.....	100	29	66.4	0.59
Ashland.....	78	30	49.4	6.30	Burnett t.....	96	29	64.6	2.30
Athens.....	91	26	53.7	5.01	Fort Reno t.....	98	32	61.8	1.92
Auburn.....	80	20	46.0	4.82	Fort Sill.....	98	34	65.0	0.37
Bangor.....	80	26	47.9	7.66	Gate City.....	100	26	58.6	0.01
Bellvue.....	81	23	46.7	5.81	Guthrie.....	96	24	63.8	3.54
Bement.....	89	20	44.4	6.08	Keokuk Falls.....	96	30	60.3	3.55
Benton Ridge.....	84	26	49.2	6.53	Mangum.....	102	33	64.4	0.33
Bethany.....	82	28	50.4	8.09	Ponca.....	90	30	56.9	1.60
Big Prairie.....	84	26	49.5	6.02	Sac & Fox Agency.....	94	30	62.2	2.37
Bissell.....	78	23	46.9	4.30	Stillwater.....	100	32	61.6	6.14
Bloomington.....	81	29	51.0	6.21	Winnview.....	100	32	63.8	1.82
Caledonia.....	88	24	50.7	5.80	<i>Oregon.</i>				
Cambridge.....	76	29	46.8	7.70	Albany a t.....	67	32	46.5	5.61
Camp Dennison.....	84	26	52.1	8.01	Albany b.....	74	30	45.9	3.91
Canton t.....	81	26	49.6	5.23	Ashland.....	67	31	44.8	2.35
Cardington.....	85	25	49.4	5.51	Aurora.....	62	32	47.2	4.03
Carrollton.....	84	30	52.1	7.54	Brownsville.....	74	36	47.1	5.25
Cherry Fork.....	82	25	51.7	7.49	Comstock.....	70	34	48.5	6.13
Chicago.....	84	30	52.1	7.54	Corvallis.....	63	32	47.4	4.45
Circleville.....	82	26	51.8	8.73	East Portland.....	70	29	47.4	7.22
Clarksville.....	83	28	47.4	3.61	Junction City.....	64	37	48.8	3.43
Cleveland.....	91	25	56.0	4.95	Leland.....	72	32	44.8	4.75
Colebrook.....	83	29	52.7	6.80	McMinnville.....	64	36	47.8	7.67
Dayton.....	80	26	47.8	5.25	Monmouth.....	68	35	50.0	4.85
Defiance.....	83	27	47.8	6.12	Riddles.....	66	36	41.3	2.69
Ellsworth.....	83	28	47.8	6.24	Roseburg.....	76	36	50.0	3.05
Findlay.....	87	28	51.2	8.37	Salem.....	59	29	39.9	3.46
Fostoria.....	80	21	46.2	5.66	Sheridan.....	64	32	48.8	6.50
Frankfort.....	87	28	51.2	8.37	Silverton.....	58	32	43.4	5.39
Garrettsville.....	80	21	46.2	5.66	Siskiyou.....	58	32	40.9	8.40
Georgetown.....	87	31	54.2	9.49	Springfield.....	75	34	47.4	4.83
Granville.....	87	36	50.0	7.01	W. t Fork.....	76	34	47.4	5.48
Gratiot.....	87	25	51.1	6.04	<i>Pennsylvania.</i>				
Greenfield.....	90	28	51.6	6.95	Altoona.....	78	36	53.5	3.48
Green Hill.....	83	24	46.7	6.06	Aqueduct.....	76	31	50.5	4.13
Greenville.....	81	30	49.8	8.47	Bloomington.....	71	30	43.5	3.71
Hackney.....	86	26	52.1	6.06	Bloomburg.....	75	32	48.0	3.34
Hanging Rock.....	87	28	56.1	6.90	Blue Knob.....	76	28	46.2	6.20
Harbor.....	75	28	44.5	4.89	Brookville.....	76	28	46.2	6.20
Hillhouse.....	77	25	45.9	4.57	Browers Look.....	76	28	46.2	6.20
Hiram.....	80	25	46.6	5.37	Carlisle.....	78	32	47.3	3.71
Jacksonboro.....	84	30	50.4	6.60	Chambersburg.....	78	32	47.3	3.71
Kenton.....	85	28	50.0	8.65	Clarion.....	79	31	49.7	5.50
Killbuck.....	86	22	49.6	6.09	Coatesville.....	79	31	49.7	5.50
Leipsic.....	86	22	49.6	6.09	Confluence.....	79	31	49.7	5.50
Levering.....	86	22	49.6	6.09					
Logan.....	91	25	54.8	6.98					
Lordstown.....	78	25	47.0	5.40					
Lowell.....	91	25	53.3	5.33					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Pennsylvania—Con.</i>	°	°	°	<i>Ins.</i>	<i>S. Dakota—Cont'd.</i>	°	°	°	<i>Ins.</i>
Coopersburg.....	72	30	47.7	4.07	Alexandria.....	81	16	42.8	5.35
Corry.....	73	16	44.0	5.25	Ashcroft.....	74	18	36.8	0.59
Davis Island Dam.....	73	16	44.0	5.25	Bear Valley.....	70	24	37.5	3.20
Doylestown.....	73	24	43.7	4.66	Bowdle.....	60	4	37.4	0.81
Drifton.....	73	24	43.7	4.63	Britton.....	65	5	37.0	2.55
Du Bois.....	68	22	41.8	3.65	Castlewood.....	68	8	30.4	1.58
Dyberry.....	76	28	47.1	3.92	Clark.....	81	11	41.3	3.52
East Mauch Chunk.....	73	31	47.1	3.86	Cross.....	71	14	36.9	1.38
Easton.....	67	23	42.5	4.21	De Smet.....	68	13	34.6	3.00
Edinboro.....	73	22	46.4	4.21	Faulkton.....	79	16	40.2	3.61
Emporium.....	73	22	46.4	4.21	Flandreau.....	74	15	41.5	6.85
Esks of Neshami.....	73	22	46.4	4.21	Forestburg.....	74	15	41.5	6.85
Frederick.....	73	22	46.4	4.01	Fort Meade.....	70	21	40.4	3.45
Freeport.....	73	22	46.4	3.65	Frankfort.....	74	15	42.4	3.50
Gettysburg.....	73	31	46.2	3.58	Frankfort.....	70	8	39.5	3.15
Girardville.....	73	31	46.2	3.58	Gale.....	67	10	37.8	1.94
Grampian.....	70	28	44.3	4.89	Gary.....	72	13	37.7	4.03
Greensboro.....	77	29	48.3	5.04	Highmore.....	71	9	39.6	3.85
Hamburg.....	77	29	48.3	4.53	Hitchcock.....	75	10	41.4	3.42
Holidaysburg.....	84	26	49.8	5.22	Hotch City.....	75	10	41.4	1.91
Honesdale.....	68	25	43.0	3.89	Howard.....	74	14	40.2	4.21
Huntingdon.....	82	27	49.2	4.61	Kimball.....	75	12	39.4	3.13
Johnstown.....	85	30	49.8	5.44	Mellette.....	80	19	39.3	3.89
Kennett Square.....	76	35	48.5	4.55	Midland.....	80	15	42.6	2.75
Kilmer.....	76	35	48.5	5.34	Oelrichs.....	82	13	42.6	3.30
Lancaster.....	77	32	49.9	5.07	Onida.....	73	9	38.1	1.32
Lansdale.....	77	32	49.9	4.59	Orway.....	73	9	38.1	3.56
Lebanon.....	77	30	48.1	3.67	Parker.....	77	16	40.9	4.72
Le Roy.....	68	26	42.0	4.19	Parkston.....	77	13	42.0	4.34
Lewistown.....	78	28	47.2	4.62	Piedmont.....	73	15	40.0	0.35
Ligonier.....	83	27	47.5	5.52	Plankinton.....	73	15	40.0	3.93
Lock Haven.....	79	27	46.5	4.72	Rosebud.....	73	23	42.2	1.94
Lock No. 4.....	79	27	46.5	4.62	Salem.....	76	14	40.1	3.50
Lycippus.....	74	35	50.7	5.87	Sioux Falls.....	76	16	40.4	4.29
McConnellsburg.....	74	30	49.7	4.61	Spearfish.....	75	19	39.7	4.21
Mahoning.....	74	35	50.7	5.71	Tyndall.....	76	20	43.5	3.38
Mendville.....	75	23	45.1	5.30	Vermillion.....	80	7	42.2	3.00
Newcastle.....	76	24	50.7	3.09	Watertown.....	72	12	39.2	1.37
Oil City.....	76	24	50.7	4.02	Webster.....	66	6	37.8	3.59
Ottaville.....	76	24	50.7	4.80	Wentworth.....	70	14	35.4	3.65
Parker.....	77	32	49.9	5.40	Wessington Spgs.....	76	13	41.3	3.19
Philadelphia.....	77	32	49.9	5.35	Wolsey.....	70	17	39.3	4.19
Philadelphia.....	76	34	51.7	5.50	<i>Tennessee.</i>				
Philadelphia.....	77	34	51.3	5.71	Andersonville.....	84	31	61.8	4.00
Phoenixville.....	77	33	50.7	5.24	Ashwood.....	83	35	61.2	7.52
Point Pleasant.....	77	33	50.7	4.80	Austin.....	87	36	61.8	4.37
Pottstown.....	76	35	51.1	6.20	Bethel Springs.....	85	38	67.4	8.35
Quakertown.....	76	28	47.4	5.15	Bolivar.....	85	40	66.8	8.55
Reading.....	76	28	47.4	2.95	Byrdstown.....	86			3.40
Ridgway.....	76	28	47.4	4.58	Carthage.....	86			5.99
Saegertown.....	74	24	45.2	4.43	Charleston.....	86			5.10
Salem Corners.....	67	28	41.7	4.45	Clarksville.....	86	32	62.4	6.62
Salisbury.....	74	24	45.2	4.40	Clinton.....	86			4.79
Seisholtzville.....	74	24	45.2	4.20	Columbia.....	86			7.21
Selins Grove.....	74	30	49.3	4.64	Covington.....	86	36	63.0	5.80
Skippack.....	77	30	49.0	4.60	Dunlap.....	84	38	63.2	5.10
Smithport.....	72	18	41.0	4.60	Fayetteville.....	84	38	63.2	8.73
Smiths Corners.....	80	27	44.4	5.08	Florence Station.....	82	36	61.9	3.75
Somersett.....	80	27	44.4	5.46	Franklin.....	85	31	62.8	4.99
South Eaton.....	74	28	46.1	3.53	Greenville.....	83	31	59.9	6.05
State College.....	78	29	46.3	5.13	Harrisburg.....	92	30	61.8	3.16
Stoyestown.....	78	29	46.3	4.85	Harrogate.....	82	30	60.3	2.83
Stoworthmore.....	76	35	48.9	5.51	Hohenwald.....	88	30	63.6	8.66
Uniontown.....	83	29	51.8	6.11	Jacksboro.....	86	31	58.3	3.81
Warren.....	83	29	51.8	4.10	Jackson.....	86	38	64.0	7.35
Wellsville.....	68	25	40.1	5.38	Johnson City.....	87	33	61.3	2.71
West Chester.....	76	33	49.8	5.02	Johnsonville.....	87	33	61.3	8.10
West Newton.....	76	33	49.8	5.55	Kingston.....	87	33	61.3	5.22
Wilkesbarre.....	77	28	49.0	3.27	Lookout Mount.....	80	32	57.5	4.52
York.....	81	30	50.4	4.37	Loudon.....	80	32	57.5	4.94
<i>Rhode Island.</i>					Lynnville.....	84	34	58.2	7.93
Bristol.....	60	26	42.7	2.83	McKenzie.....	86	38	68.4	3.75
Kingston.....	64	23	42.3	5.98	Missionary Ridge.....	44	61.8		
Lonsdale.....	66	30	45.7	4.15	Newport.....	86	28	60.8	3.83
Newport.....	66	30	45.7	4.15	Nunnally.....	88	35	64.2	5.56
Olneyville.....	70	25	45.9	4.15	Palmetto.....	88	38	65.5	7.18
Pawtucket.....	70	24	45.0	3.97	Parksville.....	85	33	65.3	3.62
Providence.....	69	27	46.7	4.51	Riddletown.....	86	32	61.0	6.00
Providence.....	70	21	44.4	4.09	Rockwood.....	86	32	61.0	6.38
Providence.....	70	23	43.8	4.69	Rogersville.....	84	38	60.1	4.06
<i>South Carolina.</i>					Rugby.....	85	33	60.2	4.27
Anderson.....				1.95	Savannah.....	84	39	65.0	7.18
Camden.....				0.48	Springdale.....	90	28	62.1	5.00
Cheraw.....	94	35	66.2	0.63	Strawberry Plains.....				4.25
Cheraw.....	94	35	66.2	0.98	Tazewell.....				3.97
Conway.....	90	41	65.8	2.09	Tullahoma.....	84	34	62.0	
Effingham.....	88	34	64.8	0.61	Waynesboro.....	83	33	60.4	7.75
Evergreen.....	88	34	64.8	1.83	<i>Texas.</i>				
Greenville.....				2.95	Albany.....	95	32	67.6	2.23
Kitchens Mills.....	90	35	66.8	0.49	Arlington.....	96	36	70.7	1.68
Longshore.....	91	40	66.8	1.11	Arthur City.....				4.04
Mount Carmel.....	91	40	66.8	1.98	Aurora.....	97	40	70.2	1.48
Nichols.....				1.65	Austin.....	95	44	75.8	2.45
Port Royal.....	86	53	68.6	1.24	Austin.....	90	49	73.4	
Saint Stephens.....				1.14	Boerne.....		43	68.4	1.89
Simpsonville.....	89	39	63.4	2.41	Brady.....	98	36	75.6	0.65
Society Hill.....	88	42	67.1	0.96	Brazoria.....	84	46	71.3	3.47
Statesburg.....	88	43	67.4	0.65	Brenham.....	91	45	73.9	1.74
Tillers Ferry.....				0.64	Brownwood.....	98	37	71.8	0.93
Trial.....	91	38	68.7	0.89	Burnet.....	90	45	71.3	1.75
Wateree.....				0.35	Camp Eagle Pass.....	107	43	78.1	0.11
Winnabow.....	92	37	67.4	0.75	Coldwater.....				0.04
Yorkville.....	90	38	64.8	1.41	College Station.....	94	43	73.2	1.41
<i>South Dakota.</i>					Colorado.....				0.00
Aberdeen.....	72	10	37.5	4.78	Columbia.....	86	45	73.1	3.60



## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Texas—Cont'd.</i>	0	0	0	<i>Ins.</i>	<i>Virginia—Cont'd.</i>	0	0	0	<i>Ins.</i>
Corsicana†.....	94	41	71.3	3.46	Ashland†.....	90	30	57.5	2.42
Cuero†.....	91	47	75.7	2.46	Avon†.....	87	20	55.8	4.81
Dallas†.....	90	42	69.7	1.67	Bedford City†.....	85	32	56.4	3.08
Devine†.....	98	44	73.6	2.65	Big Stone Gap†.....	86	25	55.5	4.83
Durham†.....	95	45	74.2	0.57	Birdsneat†.....	84	43	57.5	2.10
Duval†.....	95	45	74.2	0.75	Blacksburg†.....	80	26	54.3	1.99
Eagle Pass†.....	95	45	74.2	0.10	Buchanan†.....	81*	34	56.2	1.85
Eastland†.....	87	34	65.1	0.10	Cape Charles†.....	81*	34	56.2	2.42
Fay†.....	94	59	75.4	0.23	Charlottesville†.....	87	32	57.0	3.54
Flower Bluff†.....	94	59	75.4	0.23	Christiansburg†.....	87	32	57.0	1.77
Forestburg†.....	100	38	65.5	1.86	Clarksville†.....	92	25	55.1	1.24
Fort Brown†.....	99	56	78.1	T.	Dale Enterprise†.....	92	25	55.1	2.25
Fort Clark†.....	97	49	76.4	1.03	Danville†.....	92	25	55.1	2.25
Fort Hancock†.....	96	24	60.6	0.00	Emporia†.....	92	25	55.1	0.95
Fort McIntosh†.....	103	52	79.8	0.00	Falls Church†.....	92	25	55.1	3.24
Fort Ringgold†.....	101	51	79.2	0.00	Hampton†.....	88	36	58.7	0.84
Gainesville†.....	94	35	67.4	3.32	Hot Springs†.....	87	24	51.8	4.40
Graham†.....	102	33	70.9	0.45	Irwin†.....	84	32	57.8	3.00
Grape Vine†.....	94	38	72.3	1.61	Lexington†.....	89	23	54.4	2.84
Hallettsville†.....	90	43	72.0	5.43	Marion†.....	83	24	55.6	4.14
Hartley†.....	89	24	55.7	0.05	Nottaway†.....	88	28	57.8	2.45
Haskell†.....	97	42	72.2	2.30	Petersburg†.....	89	32	60.0	3.37
Hidalgo†.....	97	42	72.2	2.30	Richmond†.....	90	29	59.5	3.60
Highland†.....	102	30	71.7	0.72	Richmond b†.....	90	29	59.5	2.94
Houston†.....	87	46	72.9	3.21	Riverton†.....	90	29	59.5	2.45
Huntsville†.....	90	44	72.6	2.15	Salem†.....	85	31	56.6	2.94
Laredo†.....	90	44	72.6	2.15	Saluda†.....	86	31	57.6	3.00
Liano†.....	98	40	76.7	1.50	Spottsville†.....	88	34	58.9	1.57
Luling†.....	96	45	71.8	1.24	Stanardsville†.....	87	35	55.0	2.94
McGregor†.....	95	31	58.1	2.49	Staunton†.....	88	27	53.9	3.36
Menardville†.....	99	44	71.0	0.53	Stephens City†.....	91	32	55.8	3.58
Mesquite†.....	94	38	69.6	1.56	Warsaw†.....	89	34	59.3	3.39
Mountain Spring†.....	96	40	69.5	2.39	Woodstock†.....	81	24	54.4	2.96
Nacogdoches†.....	91	43	69.6	2.79	<i>Washington.</i>				
New Braunfels†.....	94	46	73.0	3.28	Aberdeen†.....	69	30	43.3	12.29
Ochiltree†.....	96	46	68.2	0.79	Anacortes†.....	72	25	46.0	1.77
Orange†.....	96	46	68.2	0.79	Centerville†.....	68	30	44.8	8.01
Paris†.....	96	42	68.5	4.24	Chehalis†.....	68	30	44.8	8.01
Quanah†.....	104	33	66.4	0.00	Chelan†.....	68	30	44.8	8.01
Rio Grande City†.....	90	56	71.5	0.00	Clyde†.....	72	27	49.8	3.36
Rockport†.....	95	47	74.0	2.24	Colfax†.....	65	28	44.3	3.97
San Antonio†.....	95	47	74.0	2.24	Davenport†.....	71	24	43.4	1.95
San Marcos†.....	91	38	64.6	0.00	Dayton†.....	66	28	44.7	4.06
Sierra Blanca†.....	91	38	64.6	0.00	East Sound†.....	62	34	46.8	4.25
Silver Falls†.....	98	29	66.1	0.03	Elbe†.....	62	34	46.8	4.25
Stella†.....	84	52	69.6	4.43	Ellensburg†.....	74	23	44.4	2.17
Sugar Land†.....	96	39	69.1	3.67	Ferry†.....	68	32	45.5	12.31
Sulphur Springs†.....	96	39	69.1	3.67	Fort Simcoe†.....	70	28	45.0	1.30
Temple†.....	91	44	70.6	2.45	Fort Spokane†.....	65	28	44.7	3.31
Twohig†.....	108	53	82.6	1.80	Fort Townsend†.....	60	30	43.5	3.74
Victoria†.....	87	52	75.1	2.24	Madrone†.....	62	30	45.5	5.14
Waco†.....	92	43	72.3	2.40	Moxee Valley†.....	72	25	48.5	1.74
Wichita Falls†.....	100	35	69.6	0.60	Olga†.....	58	32	44.0	4.18
<i>Utah.</i>					Pine Hill†.....	67	34	46.1	2.65
Blue Creek†.....	69	34	51.2	0.40	Pomeroy†.....	69	32	47.6	2.58
Castle Gate†.....	74	20	44.1	0.71	Pullman†.....	61	30	41.7	3.13
Cisco†.....	80	19	50.8	0.40	Rosalie†.....	60	29	40.5	3.32
Corinne†.....	74	32	48.6	1.01	Seattle†.....	65	35	45.3	5.53
Deseret†.....	78	15	45.0	1.40	Silver Creek†.....	66	32	45.0	10.54
Fillmore†.....	82	19	47.4	2.09	Tacoma†.....	64	32	46.0	7.63
Fort Du Chesse†.....	88	22	52.3	0.02	Vashon†.....	65	30	46.7	3.02
Green River†.....	88	22	52.3	0.02	Waterville†.....	65	30	46.7	3.02
Grouse Creek†.....	69	22	38.0	1.90	<i>West Virginia.</i>				
Heber†.....	68	28	41.3	2.15	Bluefield†.....	81	22	54.0	4.15
Kelton†.....	72	30	48.3	0.20	Buckhannon†.....	85	28	54.8	6.99
Lake Park†.....	71	29	45.6	1.53	Buckhannon b†.....	80	28	55.0	5.70
Levan†.....	70	13	40.4	2.69	Central Station†.....	85	28	55.0	5.70
Loa†.....	70	13	40.4	2.69	Charleston†.....	80	20	46.0	3.95
Logan†.....	72	15	43.0	2.16	Davis†.....	87	27	57.4	6.98
Losee†.....	72	15	43.0	2.16	Elkhorn†.....	82	30	51.2	5.03
Moab†.....	85	26	54.2	0.34	Ellis†.....	87	27	57.4	6.98
Mount Carmel†.....	72	21	42.8	0.36	Fairmont†.....	86	30	55.2	5.87
Ogden†.....	68	35	49.9	1.40	Glenville†.....	86	30	55.2	5.87
Ogden b†.....	68	35	49.9	1.40	Grafton†.....	84	28	54.3	7.17
Parowan†.....	77	20	45.3	0.90	Harpers Ferry†.....	84	28	54.3	7.17
Promontory†.....	62	32	43.8	0.90	Hinton†.....	83	25	48.7	3.50
Provo City†.....	65	12	33.9	0.75	Kingwood†.....	83	25	48.7	3.50
Randolph†.....	75	22	44.6	0.65	Marlinton†.....	87	21	50.6	2.91
Richfield†.....	88	30	55.8	0.15	Martinsburg†.....	88	32	51.5	4.28
Saint George†.....	67	1	31.2	0.20	Morgantown†.....	84	27	52.8	5.46
Seofield†.....	67	1	31.2	0.20	New Cumberland†.....	87	28	50.6	4.10
Singletree†.....	67	15	40.6	0.17	New Martinsville†.....	81	31	53.0	5.06
Snowville†.....	71	19	42.2	0.74	Nuttallburg†.....	87	32	54.6	5.46
Terrace†.....	64	34	46.9	0.23	Parkersburg†.....	90	30	55.5	5.13
<i>Vermont.</i>					Phillippi†.....	82	22	47.6	7.98
Brattleboro†.....	67	20	42.5	3.72	Pleasant Hill†.....	82	22	47.6	7.98
Burlington†.....	60	17	40.8	1.70	Point Pleasant†.....	92	31	56.6	6.26
Chelsea†.....	52	11	32.7	2.33	Rowlesburg†.....	80	32	54.8	4.60
Cornwall†.....	64	14	37.8	2.53	Spencer†.....	85	28	50.9	5.61
Enosburg Falls†.....	62	11	37.2	2.25	Tannery†.....	85	28	50.9	5.61
Hartland†.....	62	11	37.2	2.25	Weston†.....	83	31	56.6	5.61
Hyde Park†.....	62	11	37.2	2.25	Weston b†.....	83	31	56.6	5.61
Irassburg†.....	63	10	38.6	4.62	Wheeling†.....	85	32	55.4	5.69
Jacksonville†.....	63	10	38.6	4.62	White Sulph. Springs†.....	85	32	55.4	5.69
Norwich†.....	58	14	36.7	1.49	<i>Wisconsin.</i>				
Saxtons River†.....	61*	21	38.4	1.41	Amherst†.....	67	31	39.4	5.30
Simonsville†.....	58	11	35.4	0.00	Appleton†.....	79	24	43.2	5.09
South Royalton†.....	58	11	35.4	0.00	Ashland†.....	61	11	34.2	4.53
Stratford†.....	54	17	35.8	2.13	Baraboo†.....	82	25	43.2	5.45
Vernon†.....	64	22	43.0	2.19	Barron†.....	58	7	36.2	4.91
Wells†.....	60	14	37.2	1.82	Bayfield†.....	50	13	32.8	1.76
Woodstock†.....	63	10	38.0	2.19	Beaver Dam†.....	75	25	44.1	4.78
<i>Virginia.</i>									
Abingdon†.....	80	40	57.3	2.00					
Alexandria†.....	80	40	57.3	2.00					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Wisconsin—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Wisconsin—Cont'd.</i>	°	°	°	<i>Ins.</i>
Belleville.....	83	22	42.9	5.02	Portage†.....	81	20	43.8	5.98
Beloit†.....	84	26	45.0	5.32	Prairie du Chien.....	81	23	43.7	6.07
Black River Falls†.....	71	15	40.0	3.38	Raymond.....	81	23	43.7	3.67
Butternut†.....	59	0	34.0	2.52	Reedsburg†.....	82	24	41.9	5.77
Cadiz* <sup>2</sup> .....	.....	26	40.0	3.65	Sharon†.....	74	24	41.7	5.99
Centralia.....	68	22	40.1	2.61	Shawano.....	62	17	38.7	2.80
Chippewa Falls.....	.....	.....	.....	1.98	Shell Lake.....	60	14	37.0	4.01
Columbus.....	80	20	45.2	6.05	Sparta b†.....	79	15	40.9	5.13
Delavan (near)†.....	83	27	45.1	4.79	Stevens Point†.....	66	23	41.8	3.94
Depere.....	80	21	40.6	3.62	Valley Junction†.....	79	20	41.0	4.48
Eau Claire.....	65	18	39.8	5.90	Viroqua.....	76	20	40.0	4.78
Florence†.....	59	10	35.3	3.28	Watertown†.....	82	20	41.8	4.38
Fond du Lac <sup>1</sup> .....	83	22	41.7	3.40	Waukesha†.....	.....	.....	.....	5.64
Grantsburg†.....	83	12	36.3	3.35	Westfield†.....	78	22	42.0	4.27
Hammond†.....	68*	18*	39.0*	5.35	Weston*† <sup>2</sup> .....	62	16	37.4	5.41
Harvey†.....	83	23	42.8	5.95	<i>Wyoming.</i>				
Hayward†.....	65	13	37.6	2.05	Big Horn Ranch† <sup>1</sup> .....	65	1	29.8	0.79
Hillsboro.....	80	16	40.9	5.08	Camp Pilot Butte.....	67	11	35.2	1.37
Hudson.....	67	18	39.6	5.55	Evanston†.....	65	10	36.4	0.41
Janesville.....	84	19	43.9	4.00	Fort McKinney.....	74	17	38.7	0.74
Juneau†.....	83	23	43.2	4.43	Fort Washakie.....	68	3	36.8	2.06
Koepnick*† <sup>1</sup> .....	72	24	39.0	3.70	Fort Yellowstone.....	52	8	30.8	0.97
Lancaster†.....	78	22	42.2	5.78	Lander <sup>1</sup> .....	62	15	36.2	3.16
Madison†.....	80	26	42.4	4.53	Laramie b.....	62	9	34.2	0.32
Manitowish†.....	80	24	38.8	4.31	Lusk†.....	76	12	38.5	1.16
Meadow Valley†.....	72	22	41.2	3.23	Saratoga†.....	64	9	34.7	2.00
Medford a†.....	.....	.....	.....	3.25	Sheridan.....	72	15	37.4	1.20
Medford b†.....	63	11	36.0	3.45	Sundance.....	72	12	35.2	1.45
Menomonie <sup>1</sup> .....	66	17	36.9	6.17	Wheatland†.....	76	11	41.0	1.40
Mineral Point.....	82*	22*	44.1*	5.18	<i>Canada.</i>				
Neillsville†.....	66	17	39.4	4.55	Fort Francis, Ont.....	50	8	30.3	4.00
New Holstein†.....	78	26	40.6	4.70	<i>Mexico.</i>				
Oconomowoc†.....	81	23	44.1	5.85	Leon de Aldamas <sup>1</sup> .....	90	44	72.5	0.00
Oconto.....	65	20	39.4	3.54	<i>New Brunswick.</i>				
Oscola† <sup>1</sup> .....	63	15	36.4	3.62	Saint John.....	55	12	35.4	2.12
Oshkosh†.....	80	24	42.2	3.38	<i>West Indies.</i>				
Pepin.....	63	16	38.8	5.88	Hamilton, Ber <sup>1</sup> .....	73	57	65.6	2.1

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

<sup>1</sup> Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 4.

<sup>2</sup> Mean of 8 a. m. + 8 p. m. ÷ 2.

<sup>3</sup> Mean of 7 a. m. + 7 p. m. ÷ 2.

<sup>4</sup> Mean of 6 a. m. + 6 p. m. ÷ 2.

<sup>5</sup> Mean of 7 a. m. + 2 p. m. ÷ 2.

<sup>6</sup> Mean from readings at various hours reduced to true daily mean by special tables.

<sup>7</sup> Mean from hourly readings of thermograph.

<sup>8</sup> Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An Italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small Roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "x" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

Corrections: Georgia, Hawkinsville, January, 1893, make precipitation 3.47 instead of 1.50; Nevada, Pioche, March, 1893, make precipitation 4.19 instead of 3.34.

NOTE.—The following changes have been made in names of stations: Idaho, Henrys Lake, changed to Lake.

Data from Canadian stations for the month of April, 1893.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
Saint John's, N. F. ....	29.75	29.93	+ .09	31.7	- 4.5	8.05	.....	ne.
Halifax, N. S. ....	29.88	30.01	+ .09	35.0	- 1.5	4.21	+ 0.90	n.
Grand Manan, N. B. ....	29.97	30.03	.....	35.5	.....	2.67	- 0.75	w.
Yarmouth, N. S. ....	29.94	30.02	+ .11	35.5	- 2.5	3.50	+ 0.56	n.
Saint Andrews, N. B. ....	29.94	29.99	.....	35.2	.....	2.62	+ 0.06	nw.
Charlottetown, P. E. I. ...	29.93	29.97	.....	33.0	.....	1.87	- 1.05	nw.
Chatham, N. B. ....	29.97	29.99	+ .07	32.4	- 1.1	3.12	+ 0.02	w.
Father Point, Que. ....	29.97	30.00	+ .09	30.5	- 1.7	2.96	+ 0.94	w.
Quebec, Que. ....	29.68	30.02	+ .07	31.7	- 2.8	1.88	- 0.51	w.
Montreal, Que. ....	29.82	30.03	+ .07	35.0	- 2.5	2.18	- 0.26	sw.
Rockliffe, Ont. ....	29.46	29.99	+ .01	32.3	- 1.7	2.51	+ 1.27	se.
Kingston, Ont. ....	29.68	30.00	+ .03	37.4	- 1.1	3.05	+ 1.10	sw.
Toronto, Ont. ....	29.62	30.01	- .01	35.6	- 1.4	4.78	+ 2.90	w.
White River, Ont. ....	28.63	30.03	.....	25.4	.....	0.52	.....	n.
Port Stanley, Ont. ....	29.33	29.95	.....	39.4	.....	4.32	+ 2.19	e.
Saugeen, Ont. ....	29.24	29.97	- .03	37.2	+ 0.2	3.16	+ 1.33	n.
Parry Sound, Ont. ....	29.27	29.99	+ .01	34.5	+ 0.3	4.00	+ 2.28	se.
Port Arthur, Ont. ....	29.22	29.94	- .08	28.6	- 3.9	3.09	+ 1.72	nw.
Winnipeg, Man. ....	29.12	29.99	- .04	27.3	- 6.2	2.30	+ 0.95	ne.
Minnedosa, Man. ....	28.10	29.97	- .01	26.8	- 6.7	0.48	- 0.64	e.
Qu'Appelle, Assiniboia. ...	27.66	30.00	+ .04	26.7	- 8.8	1.07	+ 0.01	nw.
Medicine Hat, Assiniboia. ...	27.57	29.92	.....	36.5	- 7.5	0.77	+ 0.26	sw.
Swift Current, Assiniboia. ...	27.34	30.00	.....	30.8	- 7.7	0.24	- 0.94	ne.
Calgary ....	26.31	29.93	+ .01	32.7	- 5.3	0.47	- 0.15	n.
Prince Albert ....	28.44	30.02	.....	22.5	.....	0.03	.....	e.
Spence's Bridge, B. C. ....	29.04	29.87	.....	45.3	.....	0.60	.....	w.
Edmonton, Alberta ....	27.54	29.94	+ .03	32.1	- 8.1	0.61	+ 0.04	se.
Battleford, Saskatchewan. ...	28.20	30.00	.....	23.0	.....	0.13	.....	se.
Grindstone ....	23.88	29.91	.....	29.1	.....	3.73	.....	n.
Sandy Point, March, 1893. ...	29.87	29.89	.....	31.2	.....	0.94	.....	se.
Prince Albert, Sas. ....	28.46	30.09	.....	5.0	.....	0.22	.....	w.
Grindstone ....	29.86	29.90	.....	21.4	.....	5.01	.....	nw.



Table of miscellaneous meteorological data for April, 1893—Weather Bureau observations.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.					Mean temperature data since opening of station.											
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01 or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.			Cloudless days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.			
																			Miles per hour.	Direction.	Date.											
New England.																																
Eastport	53	21	29.95	30.01	+ .12	41.7	1.8	55	29	43	15	3	31	19	26	68	3.65	+ 0.4	17	8,113	nw.	41	e.	21	7	11	12	6.4	42.0	1892	33.8	1874
Portland	103	22	29.93	30.04	+ .12	39.0	2.6	61	28	46	19	3	32	32	25	67	1.94	+ 1.4	17	6,503	nw.	36	nw.	5	8	9	13	6.2	48.8	1878	36.4	1874
Manchester	247	7	29.79	30.05	+ .04	40.8	1.8	66	29	50	17	7	32	35	26	58	3.71	+ 0.7	16	5,013	nw.	31	nw.	9	8	10	13	6.2	48.0	1889	40.4	1888
Northfield	872	7	29.09	30.06	+ .10	36.4	2.3	62	9	46	11	3	27	29	26	70	1.63	+ 0.7	15	8,878	n.	44	s.	7	2	16	16	6.6	43.4	1889	35.0	1888
Boston	125	23	29.93	30.07	+ .14	44.4	0.7	68	14	52	26	7	37	39	33	69	3.13	+ 0.5	14	8,602	nw.	42	w.	5	10	4	16	5.9	48.4	1892	41.7	1874
Nantucket	14	7	30.06	30.07	+ .05	41.7	0.5	53	29	46	28	7	37	18	37	84	4.73	+ 1.9	12	8,731	sw.	54	se.	21	10	7	13	5.0	46.7	1878	41.7	1874
Woods Hole	16	16	30.06	30.07	+ .05	41.9	2.4	55	22	48	28	7	36	18	37	84	5.26	+ 1.0	14	10,371	sw.	48	sw.	5	10	8	12	5.9	48.0	1892	44.5	1888
Vineyard Haven	7	7	30.05	30.08	+ .13	44.9	1.7	68	21	54	23	7	36	35	37	84	4.30	+ 1.8	14	10,371	sw.	48	sw.	5	10	3	16	6.3	45.7	1878	41.1	1888
Block Island	27	13	30.05	30.08	+ .13	42.1	1.7	57	21	47	30	3	37	19	37	84	5.45	+ 2.4	12	10,334	sw.	63	se.	20	9	12	19	4.8	48.4	1886	42.5	1886
Narragansett Pier	12	12	30.05	30.08	+ .13	42.5	1.7	62	21	50	25	7	35	27	38	83	4.85	+ 1.6	15	8,764	sw.	51	sw.	10	19	10	19	6.2	52.4	1878	40.0	1874
New Haven	107	21	29.93	30.05	+ .08	45.2	0.6	66	1	53	29	7	37	27	38	83	3.84	+ 0.1	14	6,764	n.	38	nw.	5	7	9	14	6.2	52.4	1878	40.0	1874
New London	47	23	30.01	30.06	+ .09	44.2	0.9	62	21	51	29	3	37	27	35	77	3.12	+ 0.7	15	6,053	nw.	38	e.	20	10	7	13	5.9	50.2	1878	39.9	1874
Mid. Atlantic States.																																
Albany	85	20	29.97	30.06	+ .10	44.0	2.7	72	4	53	24	7	35	30	34	71	2.10	+ 0.5	14	7,335	nw.	38	nw.	4	6	12	12	6.4	51.5	1878	36.6	1874
New York, N. Y.	185	23	29.87	30.07	+ .09	47.8	0.9	70	4	55	32	7	41	27	37	71	6.36	+ 3.0	15	8,413	se.	40	ne.	20	8	10	13	5.9	53.6	1871	41.3	1874
Harrisburg	377	5	29.64	30.06	+ .06	48.6	0.1	75	1	95	33	7	41	32	41	77	3.07	+ 1.6	14	6,427	e.	48	nw.	4	8	10	14	6.0	52.8	1891	48.5	1892
Philadelphia	117	23	29.94	30.06	+ .07	50.8	0.1	75	4	59	34	7	43	31	39	70	4.47	+ 1.6	15	8,413	ne.	40	ne.	30	6	10	14	6.8	57.1	1871	42.0	1874
Atlantic City	53	20	30.01	30.06	+ .09	47.5	0.4	67	1	54	36	11	41	27	43	89	4.92	+ 1.6	15	9,196	sw.	41	ne.	6	7	13	10	6.1	52.3	1878	42.4	1875
New Brunswick	179	23	29.85	30.05	+ .05	49.0	0.5	81	8	61	36	16	45	35	41	70	3.32	+ 0.2	15	6,604	se.	42	nw.	15	9	11	10	5.7	58.8	1871	46.9	1874
Baltimore	112	23	29.94	30.06	+ .07	53.8	1.0	84	8	63	35	16	44	39	41	67	3.21	+ 0.2	15	5,869	n.	38	nw.	15	7	13	10	5.8	58.3	1878	47.6	1874
Washington, D. C.	20	20	29.94	30.06	+ .07	59.2	1.4	88	29	69	40	17	50	35	45	66	1.19	+ 0.3	11	4,016	sw.	30	nw.	21	8	14	8	5.7	61.5	1878	51.1	1875
Cape Henry	685	22	29.32	30.06	+ .06	57.4	1.6	87	30	68	33	24	47	39	45	66	3.42	+ 0.1	15	4,016	sw.	30	nw.	21	8	14	8	5.7	61.5	1878	51.1	1875
Lynchburg	57	23	30.01	30.08	+ .08	59.6	1.6	87	29	69	40	17	50	35	45	66	2.07	+ 0.1	11	8,278	sw.	38	s.	21	11	14	5	4.9	62.5	1871	52.3	1874
Norfolk	57	23	30.01	30.08	+ .08	59.6	1.6	87	29	69	40	17	50	35	45	66	2.07	+ 0.1	11	8,278	sw.	38	s.	21	11	14	5	4.9	62.5	1871	52.3	1874
S. Atlantic States.																																
Charlotte	773	15	29.23	30.05	+ .04	63.0	3.2	89	9	74	36	24	52	32	45	59	1.64	+ 2.1	6	7,087	sw.	42	sw.	21	13	12	5	4.5	63.2	1888	55.7	1881
Hatteras	11	13	30.10	30.11	+ .11	59.2	1.9	73	25	65	43	18	53	23	54	83	3.14	+ 2.0	11	10,257	n.	36	n.	10	14	12	4	4.1	60.8	1890	50.9	1875
Kittyhawk	9	19	30.06	30.07	+ .08	57.6	2.8	83	29	66	41	18	49	30	51	81	0.95	+ 4.0	9	12,156	sw.	42	ne.	10	14	9	7	4.3	60.8	1890	50.9	1875
Raleigh	388	7	29.65	30.07	+ .08	62.2	4.7	91	9	73	37	24	52	34	50	68	1.40	+ 1.2	9	5,208	sw.	32	sw.	1	9	8	13	5.6	62.2	1893	57.2	1883
Southport	34	18	30.06	30.09	+ .07	63.0	2.9	75	28	69	44	17	57	25	59	88	1.39	+ 1.5	6	9,015	sw.	45	sw.	20	16	9	5	3.9	63.7	1893	56.4	1881
Wilmington	78	23	30.01	30.10	+ .09	65.8	4.5	89	9	74	44	17	58	25	56	88	1.02	+ 2.2	8	8,520	sw.	38	sw.	20	12	12	0	4.8	65.8	1893	57.6	1881
Charleston	52	23	30.06	30.11	+ .08	68.2	4.0	87	10	76	50	17	60	23	56	73	1.16	+ 2.9	5	7,536	sw.	66	s.	20	9	18	3	4.3	68.2	1893	61.4	1891
Columbia	6	6	30.06	30.11	+ .08	69.4	4.0	87	10	76	50	17	60	23	56	73	1.16	+ 2.9	5	7,536	sw.	66	s.	20	9	18	3	4.3	68.2	1893	61.4	1891
Fort Hill	209	22	29.87	30.10	+ .07	68.9	4.6	91	30	80	43	18	58	35	52	61	0.97	+ 2.8	3	5,292	n.	40	sw.	21	19	9	2	2.9	68.9	1893	60.6	1875
Augusta	98	23	30.00	30.11	+ .06	70.0	3.9	89	10	79	51	24	61	26	59	78	2.20	+ 1.6	3	7,049	n.	32	s.	20	8	18	4	4.5	70.0	1893	63.5	1873
Savannah	43	22	30.06	30.11	+ .07	72.6	3.8	90	28	83	53	21	62	32	59	72	2.07	+ 0.4	3	5,729	se.	45	sw.	20	13	15	2	4.1	72.6	1893	66.5	1873
Jacksonville	28	6	30.08	30.11	+ .06	74.0	3.8	88	30	80	55	1	68	20	67	79	3.55	+ 0.8	5	6,849	se.	30	n.	23	18	11	1	3.3	74.0	1893	70.6	1880
Jupiter	22	23	30.08	30.10	+ .06	77.6	1.6	85	24	82	65	1	73	13	67	74	0.56	+ 0.8	2	6,898	e.	24	e.	8	16	12	2	3.8	79.2	1883	73.2	1891
Key West	22	23	30.08	30.10	+ .06	77.6	1.6	85	24	82	65	1	73	13	67	74	0.56	+ 0.8	2	6,898	e.	24	e.	8	16	12	2	3.8	79.2	1883	73.2	1891
Mico	36	20	30.08	30.12	+ .04	73.3	3.0	89	28	84	53	1	63	31	63	76	1.34	+ 0.9	4	6,585	w.	36	sw.	20	13	12	5	4.3	70.0	1893	67.3	1891
Tampa	44	6	30.08	30.12	+ .04	73.3	3.0	89	28	84	53	1	63	31	63	76	1.34	+ 0.9	4	6,585	w.	36	sw.	20	13	12	5	4.3	70.0	1893	67.3	1891
Titusville	44	6	30.08	30.12	+ .04	73.3	3.0	89	28	84	53	1	63	31	63	76	1.34	+ 0.9	4	6,585	w.	36	sw.	20	13	12	5	4.3	70.0	1893	67.3	1891
Eastern Gulf States.																																
Atlanta	1,131	15	28.89	30.07	+ .03	64.2	2.6	84	29																							

Table of miscellaneous meteorological data for April, 1893—Weather Bureau observations—Continued.

Districts and stations.	Elevation above sea level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.			Mean temperature data since opening of station.														
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Miles per hour.	Direction.	Cloudless days.	Partly cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.						
Ex. Northwest—Con.																																
Fort Buford.....	1,890	15	27.89	29.96	-.01	36.5	-1.6	72	23	45	8	35	39	21	58	0.38	0.38	6	7,596	n.	48	w.	3	5	17	6.9	48.7	1889	35.5	1880		
Upper Miss. Valley.																																
Minneapolis.....	758	23	29.05	29.89	-.06	40.2	-1.3	73	3	49	21	13	32	36	72	5.01	5.01	12	8,883	e.	50	sw.	13	5	17	7.3	50.9	1878	36.9	1874		
Red Wing.....	550	21	29.05	29.91	-.06	39.0	-1.3	72	4	47	19	13	31	34	75	5.30	5.30	11	7,359	nw.	31	nw.	8	4	9	7.3	50.9	1878	36.9	1874		
Saint Paul.....	720	21	29.10	29.90	-.06	43.3	-1.3	76	3	51	25	23	35	37	72	3.80	3.80	12	7,245	nw.	33	ne.	20	4	9	7.4	53.9	1878	40.2	1874		
La Crosse.....	613	22	29.20	29.87	-.11	47.1	-1.3	85	7	55	27	14	39	34	69	4.50	4.50	12	11,567	e.	50	sw.	12	4	11	7.4	54.7	1878	41.2	1874		
Davenport.....	869	15	28.94	29.89	-.07	45.0	-1.4	80	7	54	22	15	37	36	70	5.01	5.01	12	8,769	nw.	41	se.	25	6	11	7.5	52.8	1890	43.4	1881		
Des Moines.....	651	20	29.17	29.89	-.08	45.2	-1.3	80	7	53	26	15	37	37	72	4.32	4.32	16	6,726	w.	36	sw.	12	2	10	7.6	53.6	1878	41.3	1874		
Dubuque.....	613	22	29.22	29.88	-.08	49.9	-1.2	85	7	56	27	15	42	33	40	72	5.41	5.41	16	7,375	se.	38	nw.	20	11	5	7.9	57.5	1878	44.0	1874	
Keokuk.....	359	22	29.56	29.95	-.02	60.2	-1.6	83	8	59	33	14	52	29	49	69	0.91	0.91	13	8,812	se.	47	n.	12	6	9	6.6	64.1	1878	52.0	1874	
Calmar.....	644	14	29.21	29.91	-.08	51.3	-1.8	85	7	59	31	23	43	30	40	71	10.23	10.23	19	9,298	ne.	42	n.	12	4	11	7.0	56.1	1886	47.9	1881	
Springfield, Ill.....	534	22	29.30	29.88	-.08	52.0	-1.8	86	7	60	28	15	44	32	40	68	6.06	6.06	18	9,397	e.	60	sw.	11	4	18	7.0	56.1	1886	47.9	1881	
Hannibal.....	571	23	29.29	29.90	-.07	56.6	-1.8	88	7	63	33	15	48	34	45	69	10.84	10.84	15	9,938	se.	54	sw.	12	5	10	7.5	61.3	1878	47.6	1874	
Missouri Valley.																																
Columbia.....	552	22	28.85	29.89	-.06	55.2	-1.8	89	6	66	26	23	44	35	40	65	11.30	11.30	16	7,798	se.	44	e.	19	10	9	5.4	57.0	1890	52.5	1892	
Kansas City.....	663	8	28.85	29.89	-.06	53.8	-1.8	88	6	63	27	14	44	32	40	65	4.28	4.28	14	7,975	ne.	34	sw.	12	8	12	5.5	57.0	1890	52.5	1892	
Springfield, Mo.....	1,356	8	28.46	29.89	-.09	57.8	-1.8	88	6	67	31	15	48	30	42	62	5.32	5.32	15	9,659	se.	50	nw.	20	8	11	5.4	59.0	1888	54.8	1892	
Leavenworth.....	557	22	28.97	29.90	-.06	53.4	-1.3	91	6	63	26	14	44	35	40	67	3.85	3.85	12	10,026	nw.	50	nw.	20	6	9	6.7	58.5	1878	48.1	1873	
Topeka.....	622	22	28.97	29.90	-.06	55.8	-1.3	92	6	68	27	15	44	36	40	67	2.21	2.21	13	8,776	e.	10	14	6	10	14	6.6	56.8	1891	52.5	1892	
Omaha.....	1,113	22	28.70	29.91	-.07	48.4	-3.0	82	3	58	24	14	39	36	33	63	3.12	3.12	11	8,411	nw.	48	nw.	20	14	7	4.7	55.2	1890	44.4	1881	
Crete.....	66	22	28.70	29.91	-.07	50.4	-3.0	82	3	58	24	14	37	42	27	63	0.61	0.61	7	8,411	nw.	48	nw.	20	14	7	4.7	55.2	1890	44.4	1881	
Valentine.....	8	27	27.17	29.95	-.06	43.0	-4.7	78	6	53	15	14	31	45	27	63	2.76	2.76	10	10,304	nw.	52	w.	7	4	15	6.5	51.8	1889	42.0	1893	
Sioux City.....	1,165	22	28.62	29.89	-.08	44.6	-4.7	82	3	55	21	13	34	38	31	68	3.56	3.56	10	11,790	nw.	54	nw.	20	5	12	6.5	51.8	1889	42.0	1893	
Pierre.....	1,470	22	28.34	29.93	-.06	43.2	-4.7	74	3	52	18	14	32	41	29	68	2.19	2.19	10	8,488	nw.	60	w.	7	9	11	5.9	51.8	1889	42.0	1893	
Huron.....	1,310	12	28.48	29.92	-.06	40.4	-5.4	73	3	51	14	14	30	41	30	73	4.06	4.06	12	11,483	nw.	60	nw.	7	5	11	6.6	46.9	1889	40.4	1893	
Yankton.....	1,232	21	28.59	29.93	-.04	44.6	-5.4	81	3	55	20	13	34	38	29	63	4.38	4.38	12	9,963	nw.	42	nw.	20	9	12	5.8	52.4	1889	38.6	1881	
Northern Slope.																																
Havre.....	2,477	13	27.28	29.95	-.02	36.8	-7.6	69	2	48	16	28	26	38	25	69	1.14	1.14	6	7,328	ne.	42	nw.	17	3	18	9	6.4	50.4	1889	36.8	1893
Miles City.....	2,374	13	27.38	29.92	-.02	40.3	-7.6	69	2	48	16	28	26	38	25	62	1.45	1.45	7	5,583	nw.	47	w.	7	2	18	10	6.4	50.4	1889	36.8	1893
Helena.....	4,118	14	23.70	29.99	-.01	38.8	-6.1	67	2	45	16	8	30	30	24	60	2.31	2.31	12	5,726	sw.	37	sw.	14	6	16	6.7	49.2	1889	36.8	1880	
Rapid City.....	3,260	8	26.52	29.95	-.06	40.1	-5.8	67	2	45	16	8	30	30	24	60	1.05	1.05	10	8,776	nw.	63	sw.	7	6	16	7.0	49.8	1889	40.1	1893	
Cheyenne.....	6,105	23	23.88	29.00	-.01	38.6	-4.5	71	6	49	18	19	28	37	23	57	1.36	1.36	11	8,872	w.	50	w.	7	8	16	6	5.2	47.8	1888	33.9	1873
Lander.....	5,377	22	24.51	29.98	-.01	37.0	-4.5	66	5	49	2	19	24	40	19	55	2.14	2.14	9	4,513	sw.	48	sw.	7	12	9	5.1	47.8	1888	33.9	1873	
Kearney.....	2,206	22	27.57	29.92	-.02	47.8	-4.5	80	3	60	20	14	35	41	27	54	0.40	0.40	4	12,525	nw.	60	n.	19	12	8	5.2	47.8	1888	33.9	1873	
North Platte.....	2,841	19	26.97	29.96	-.02	45.2	-4.2	80	3	58	19	14	32	41	25	52	0.15	0.15	2	10,357	nw.	54	w.	7	7	16	7	5.6	52.1	1888	42.0	1875
Middle Slope.																																
Colorado Springs.....	6,098	22	23.90	29.96	-.02	42.7	-4.0	72	4	55	6	14	30	40	16	42	0.54	0.54	6	9,359	n.	58	sw.	6	12	10	8	4.8	50.4	1889	36.8	1893
Denver.....	3,297	22	24.63	29.98	-.00	45.1	-3.0	77	5	57	13	19	33	36	20	43	0.87	0.87	12	7,199	nw.	36	ne.	24	13	5	4.5	53.2	1888	39.7	1873	
Pikes Peak.....	11,356	16	17.56	29.98	-.00	11.1	-11.1	29	5	17	12	19	6	17	4	77	12.42	12.42	11	22,550	sw.	83	w.	4	8	13	9	4.4	50.8	1888	7.8	1874
Pueblo.....	4,734	5	25.13	29.93	-.02	47.6	-1.3	79	5	62	15	14	33	47	12	34	0.29	0.29	5	7,779	nw.	52	sw.	6	10	13	7	4.8	53.8	1889	47.6	1893
Concordia.....	1,410	8	26.32	29.90	-.13	53.6	-1.3	97	6	67	25	14	41	49	36	60	0.86	0.86	2	8,237	nw.	48	n.	11	20	5	5	3.5	56.8	1891	51.0	1886
Dodge City.....	2,523	19	27.26	29.89	-.05	53.5	-1.3	93	6	68	28	14	43	39	25	42	0.04	0.04	1	10,982	n.	58	sw.	11	15	12	3	3.9	56.8	1888	48.5	1875
Wichita.....	1,366	5	28.42	29.88	-.05	57.8	-1.3																									



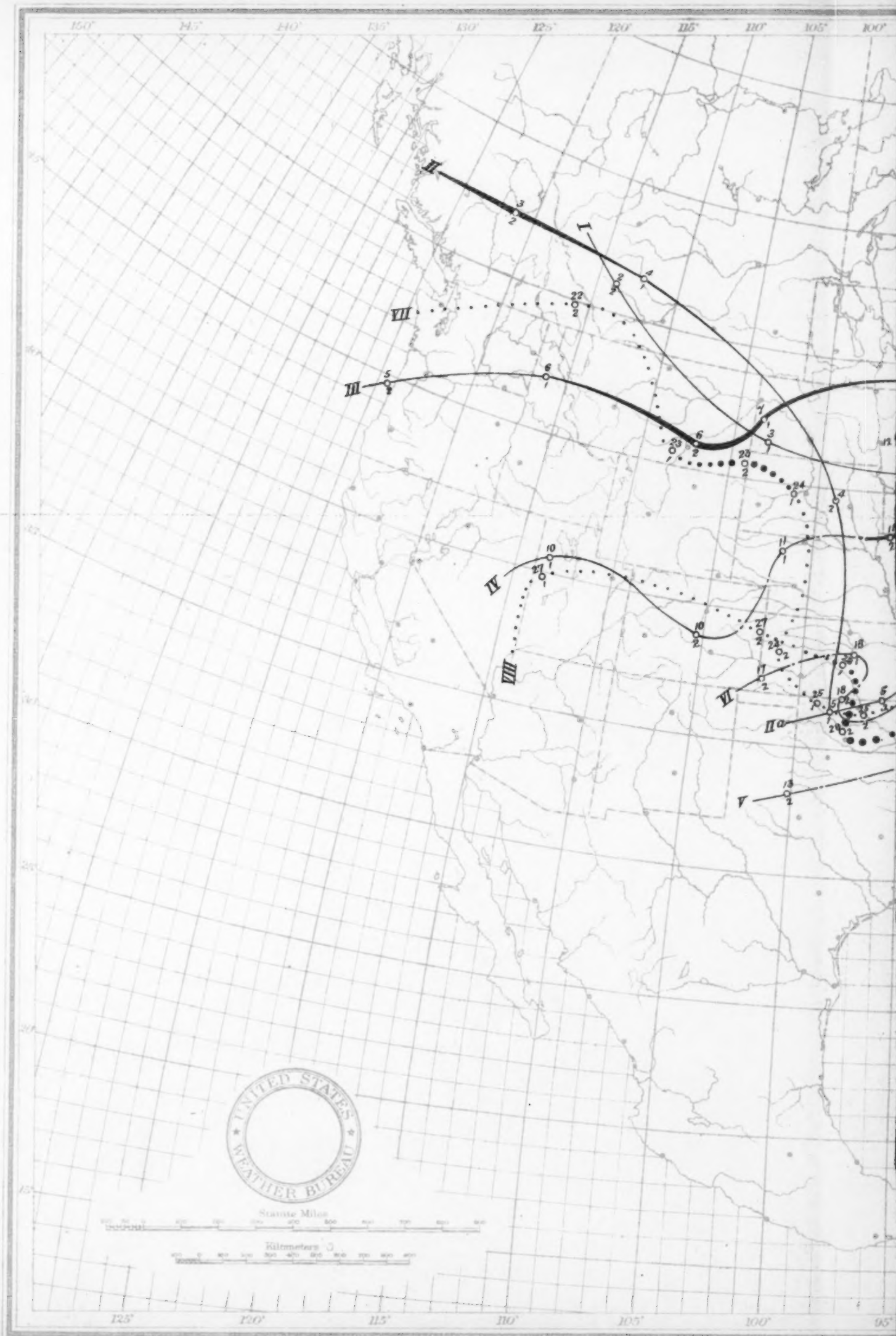


Chart I. Tracks of areas of Low Pressure. April, 1893.



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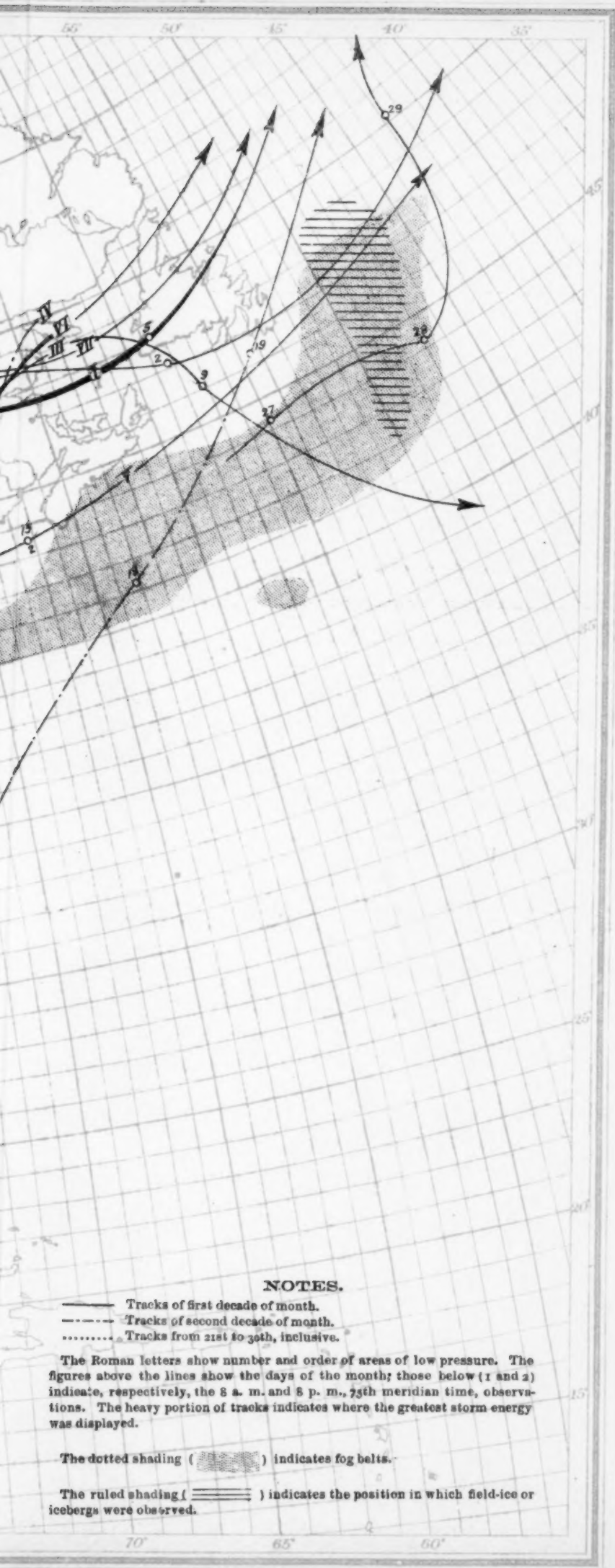






Chart II. Isobars, Isotherms, and Winds. April, 1893.

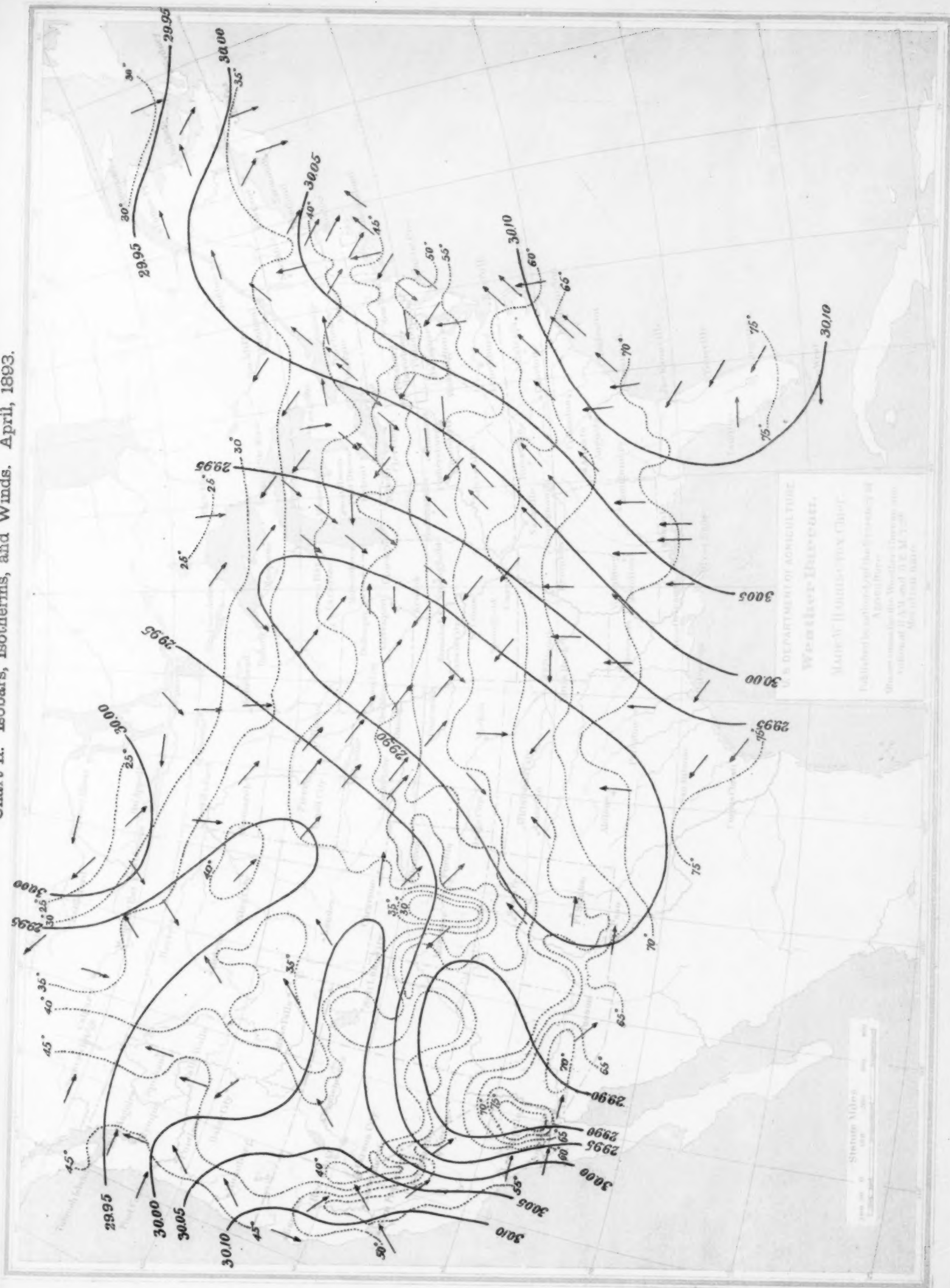






Chart III. Precipitation. April, 1893.

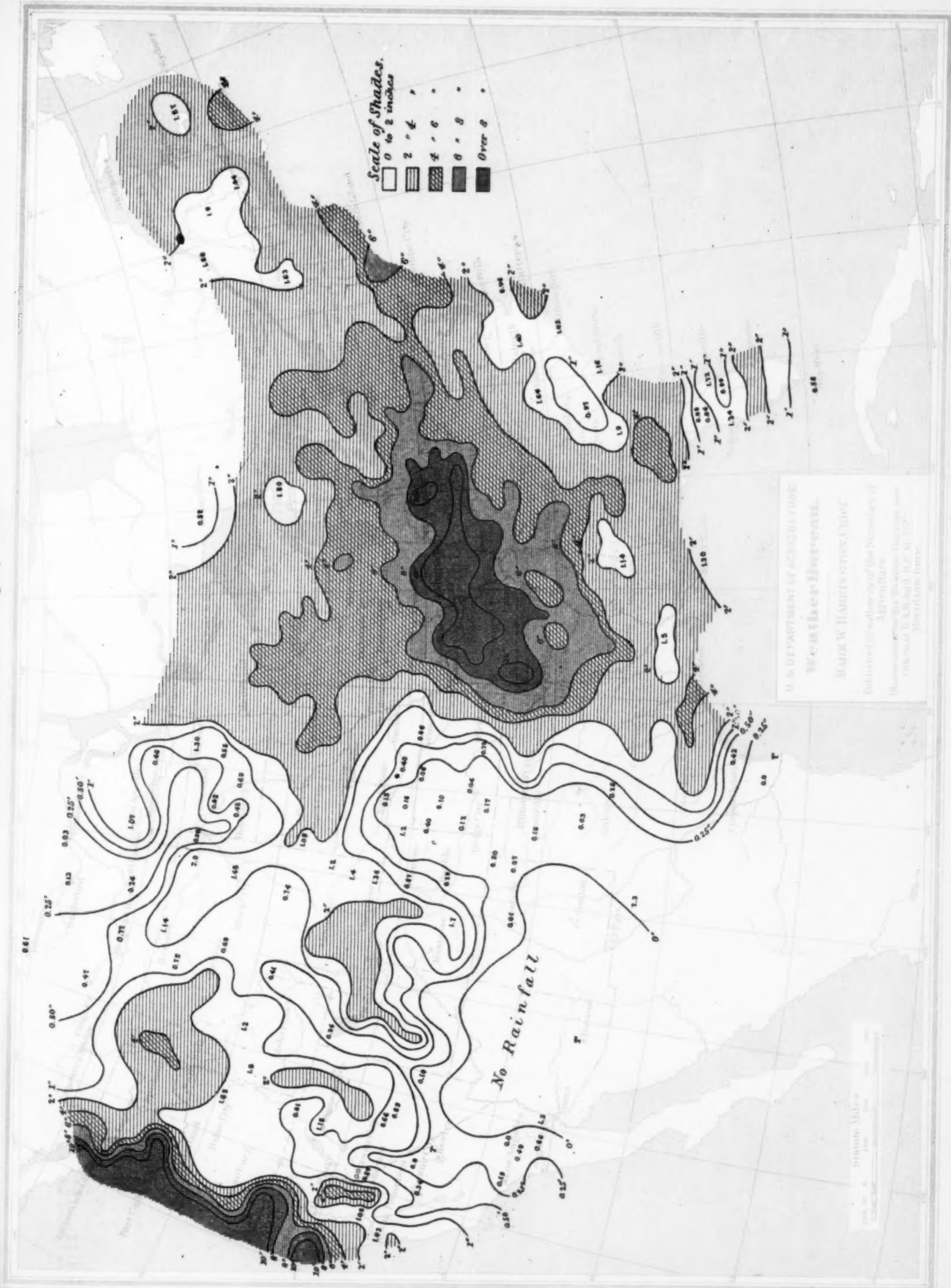
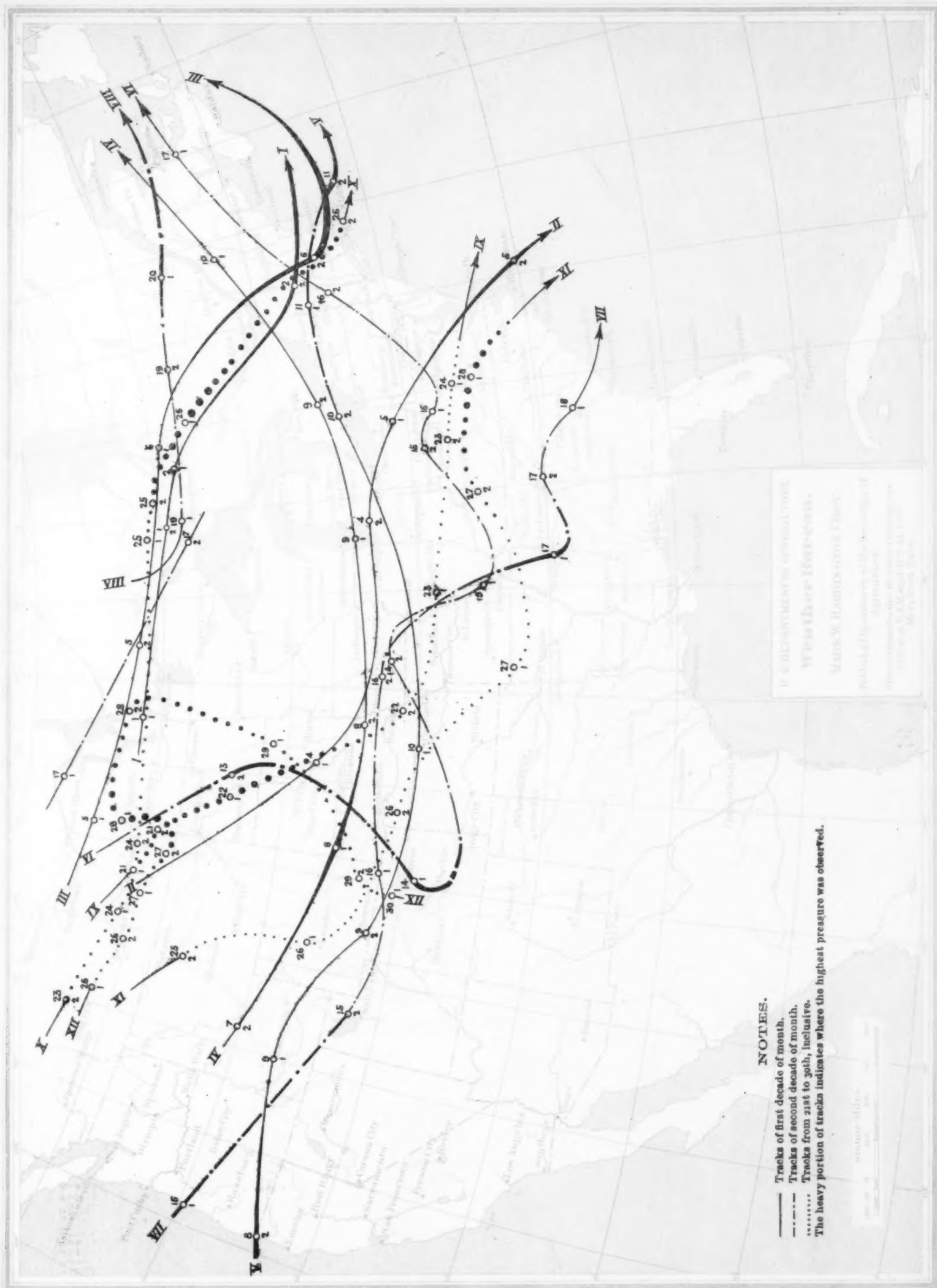






Chart IV. Tracks of areas of High Pressure. April, 1893.



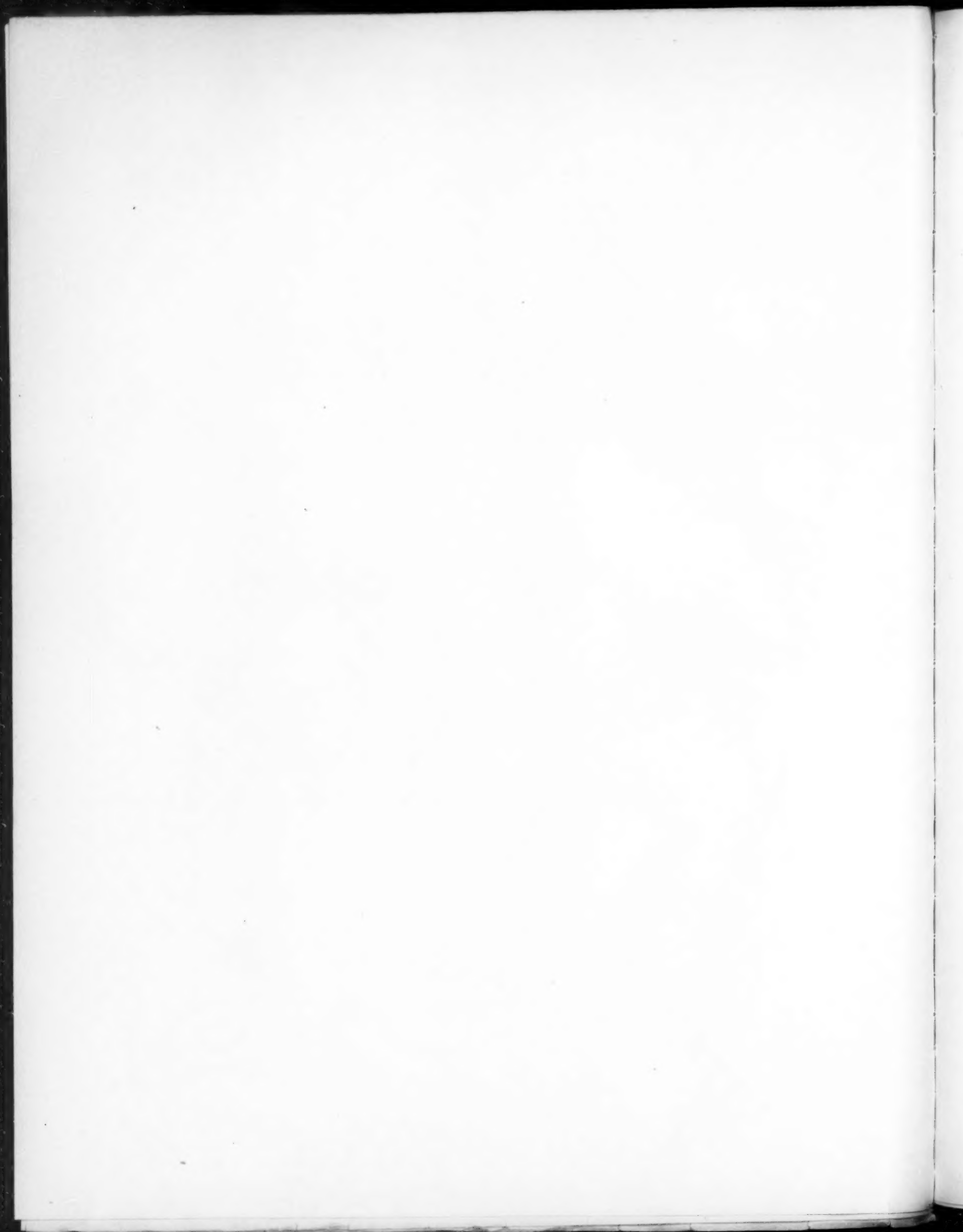




Chart V. Depth of Snowfall (inches) and Limits of Freezing Weather, April, 1893.



U.S. DEPARTMENT OF AGRICULTURE  
 BUREAU OF WEATHER SERVICE  
 OFFICE OF THE CHIEF OF BUREAU  
 WASHINGTON, D.C.  
 APRIL 1893

Scale of Miles  
 0 10 20 30 40 50 60 70 80 90 100





Chart VI. Normal Pressure (20 years) and Average Wind Direction (15 years) for April.

